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ARTICLES

A new method for increasing the robustness of cladistic analyses

David Morrison
Institute of Banksia Studies

Introduction

A cladogram is a set of explicit hypotheses concerning the phylogenetic relationships among a group of taxa. As such, it is amenable to testing and re-assessment in the light of new character data, or even by a new examination of the old character data. The robustness of a cladogram (or part of a cladogram) is then a measure of how resistant the cladogram is to change, either as new data are introduced into the data matrix or as the old data are modified. Robustness is usually a product of the congruence between the characters in the data matrix, and is therefore a result of the number of characters that support any particular branch of the cladogram.

Many different methods have been proposed for measuring the robustness, or degree of confirmation, of a cladogram or parts of a cladogram. These include consistency indices (Farris, 1989; Archie, 1989b), information statistics (Brooks *et al.*, 1986), normal deviate tests (Le Quesne, 1989), randomization tests (Archie, 1989a; Faith and Cranston, 1991; Faith, 1992), and bootstrapping (Felsenstein, 1985; Sanderson, 1989). However, all of these methods are sensitive to the same basic characteristic of the data matrix: the maximum number of congruent characters (i.e. those characters that agree on the same tree topology).

Therefore, in order to increase the robustness of a cladogram we need to increase the number of congruent characters in our data matrix. That is, we don't just need more data — rather, we need more data that agree with the data that we already have. There are two ways of doing this: 1) we can employ the empirical method of selectively collecting more data from the specimens at our disposal; or 2) we can employ the inductive logical method of data enrichment.

The latter method is preferable because it allows us to increase the size of our data matrices without recourse to the expense and trouble of actually doing any further work. It also gives us far greater control over our data, because there is

no guarantee with the former method that we will be able to find any further congruent characters — the data enrichment method does, however, offer this guarantee. The only requirements for use of the data enrichment method are that you already know what the answer should be, and that you already have at least some data. The method does not, therefore, offer you complete freedom from the inconvenience and embarrassment of uncontrollable empirical results. Nevertheless, most systematists can meet both of these minimum requirements for the use of this method.

The data enrichment method was first proposed by Lewis (1957), and it has since been applied in many fields of scientific endeavour, including hazardology (Cholmondeley and Mayer, 1978), sociology (Hickey, 1983), and psychology (McKinley *et al.*, 1986). However, I believe that this is the first time its application to cladistic analysis has been proposed. Therefore, I will first illustrate the method by presenting the classic example of Lewis (1957), and then I will explore the possibilities of this method for cladistics by reference to an example from the plant family Epacridaceae.

The Data Enrichment Method

By way of example, Lewis (1957) presents an experiment performed to test the ability of a specific sound receiver to detect an audio signal. The experiment is performed in such a way that in each of a series of trials the experimenter learns either that detection was accomplished or that it was not. Trials are made with the source intensity set at six different levels, and at each of these six intensity levels a number of tests are made and the result (detection or no detection) recorded. The data from the initial experiment of 213 tests are summarized in Table 1.

We now wish to increase the amount of data available at each source level by the method of data enrichment. It is reasonable to assume that sound detectability is a function of source level and that, if all other parameters are held constant, a loud sound

Table 1. Raw data.

Source level (db)	Number of detections	Number of failures to detect	Probability of detection
62	5	40	0.11
65	10	30	0.25
68	15	20	0.43
71	20	10	0.67
74	25	5	0.83
77	30	3	0.91

Table 2. Enriched data.

Source level (db)	Number of virtual detections	Number of virtual failures	Probability of detection
62	5	108	0.04
65	15	68	0.18
68	30	38	0.44
71	50	18	0.74
74	75	8	0.90
77	105	3	0.97

is easier to detect than one of smaller intensity. Thus, it is safe to assume that if a signal was detected at a given level then it would have been detected at all higher source intensity levels. Moreover, if a signal was not detected at a given level then it would not have been detected at any lower level of source intensity. Using these simple assumptions, the data collected at one source level can be used to add to the data available for other levels, since we know how these experiments would have come out had we actually performed them. So, the number of detections at any one source intensity is added to the data for all of the higher source intensities, and the number of failures to detect is added to the data for all of the lower source intensities. Treating all of the data in this fashion, we can compile the results of 213 actual tests and a further 310 "virtual" tests, as shown in Table 2.

Two things are apparent at once. Firstly, the probabilities of detection given in Table 2 are quite different from those deduced crudely and empirically in Table 1. Secondly, the number of "virtual" trials at each level of source intensity is much larger than the actual number of trials. Hence, we may be more confident of the results in Table 2 than we are of any of the results in Table 1.

Application to Cladistics

It is clear that application of the data enrichment method to cladistic analysis is straightforward, and that we can therefore dramatically increase the size of a data matrix without the necessity of actually collecting any more data. The application follows from the observation that a synapomorphy on one branch of a cladogram is also logically a synapomorphy on all branches of

the tree that are closer to the terminal taxa. Consequently, any branch on a cladogram not only has those synapomorphies that are ascribed to it by the computer analysis program but also has "virtual" synapomorphies from all branches that are closer to the root of the tree.

This can be made obvious by an example. Figure 1 is a modified version of the preferred cladogram presented by Morrison & Powell (1990) from their empirically rigorous cladistic analysis of the plant family Epacridaceae and its relatives. The analysis was of 39 genera from the Epacridaceae, Ericaceae and Clethraceae, for which there were only 21 empirically-derived binary characters. The cladogram shown has 31 steps, but unfortunately it's one of 26 equally parsimonious trees found by the microcomputer program "Hennig86" using an exact algorithm. The consistency index is 0.67, and the retention index is 0.79. The permutation tail probability (PTP) is 0.01 (this being the probability of obtaining a tree with this amount of cladistic structure by chance alone), but the shortest tree is only two steps shorter than the trees produced by the data randomization. It is obvious from these statistics and the large number of alternative trees that there is only a moderate degree of robustness in the cladogram shown, and consequently it is problematic to justify any claim that it represents the true phylogeny.

However, we can now apply the logic of the data-enrichment method to this data set. For example, the branch near the root of the tree is indicated in Figure 1 as being supported only by character 2, but it is actually also supported by character 1, giving us one new "virtual" character on that branch. The next branch from the root is indicated as only being supported by character 3, but it is actually supported by characters 1 and 2 as well,

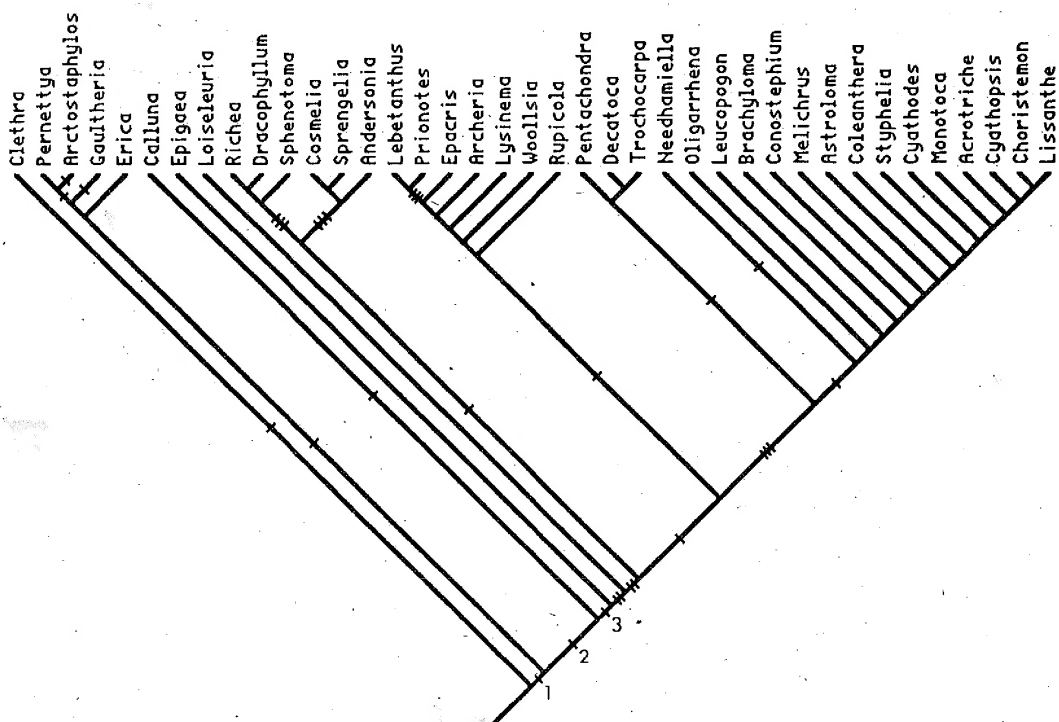


Figure 1. Cladogram of the Epacridaceae and its relatives. All of the genera are from the Epacridaceae except:- *Clethra* (Clethraceae); *Arctostaphylos*, *Gaultheria* and *Pernettya* (Vaccinioideae, Ericaceae); *Calluna* and *Erica* (Ericoideae, Ericaceae); and *Epigaea* and *Loiseleuria* (Rhododendroideae, Ericaceae). All of the character changes are marked, but only those character changes referred to in the text are numbered.

giving us two more "virtual" characters for that branch. In this fashion, we can increase the number of characters in the data set to 112 binary characters, with 21 of the old empirical characters and 91 of the new "virtual" characters.

The cladogram derived from the analysis of this enriched data set has exactly the same topology as the old one, but it now has 122 steps, and it's the only tree of that length. The consistency index has been increased to 0.91, and the retention index is now 0.95. Furthermore, the tree is now nearly 100 steps shorter than the trees produced by the PTP test. This is therefore a far more robust (and therefore more desirable) cladogram.

So, we have substantially increased the size of the data set, and all of the new characters are completely congruent with our chosen cladogram. We now have only one most parsimonious cladogram, and we have also increased the degree of confirmation of each branch on the tree. Consequently, we can now be more confident that our cladogram represents the true phylogeny.

Conclusion

It is clear from this example that the data enrichment method has three desirable contributions to make to cladistics:- 1) we can increase the size of our data matrices without recourse to the difficulties inherent in the empirical method; 2) the new data will always be congruent with our preferred cladogram; and 3) the resulting cladogram will always be more robust. What more could you ask for?

Acknowledgements

Thanks to John Trueman and Dan Faith for doing the PTP tests.

References

- Archie, J.W. (1989a) A randomization test for phylogenetic information in systematic data. *Syst. Zool.* 38: 239-252.

- Archie, J.W. (1989b) Homoplasy excess ratios: new indices for measuring levels of homoplasy in phylogenetic systematics and a critique of the consistency index. *Syst. Zool.* 38: 253-269.
- Brooks, D.R., O'Grady, R.T., and Wiley, E.O. (1986) A measure of the information content of phylogenetic trees, and its use as an optimality criterion. *Syst. Zool.* 35: 571-581.
- Cholmondeley, L., and Mayer, H. (1978) On a new method in hazardology. *J. Irrep. Results* 24(1): 17-18.
- Faith, D.P. (1992) Cladistic permutation tests for monophyly and polyphyly. *Syst. Zool.* in press.
- Faith, D.P., and Cranston, P.S. (1991) Could a cladogram this short have arisen by chance alone?: On permutation tests for cladistic structure. *Cladistics* 7: 1-28.
- Farris, J.S. (1989) The retention index and the rescaled consistency index. *Cladistics* 5: 417-419.
- Felsenstein, J. (1985) Confidence limits on phylogenies: an approach using the bootstrap. *Evolution* 39: 783-791.
- Hickey, J.L.S. (1983) Reducing automobile accidents. In: *The Best of the Journal of Irreproducible Results* (G.H. Scherr, ed.), p. 88. Workman Publishing, New York.
- Le Quesne, W.J. (1989) The normal deviate test of phylogenetic value of a data matrix. *Syst. Zool.* 38: 51-54.
- Lewis, H.R. (1957) The data enrichment method. *Operations Research* 5: 551-554.
- McKinley, C.K., Reid, W.B., and Anonymous. (1986) The re-assessment of criticism and defenses of depth psychology with supporting data. In: *The Journal of Irreproducible Results: Selected Papers* (G.H. Scherr, ed.), pp. 56-57. Dorset Press, New York.
- Morrison, D.A., and Powell, J.M. (1990) Systematics and evolution of the Epacridaceae. IX Meeting of the Willi Hennig Society Abstracts, p. 39.
- Sanderson, M.J. (1989) Confidence limits on phylogenies: the bootstrap revisited. *Cladistics* 5: 113-129.

The correct author citations for *Calotropis gigantea* and *C. procera* (Asclepiadaceae)

Paul I. Forster
Queensland Herbarium
Meiers Road
Indooroopilly, Qld 4068

Introduction

A monograph of the genus *Calotropis* R.Br. has recently been published by Rahman and Wilcock (1991), wherein three species were recognized. My own account of the two species that occur naturalized in Australia has just appeared in *Nuytsia* (Forster, 1992); however, it was not possible to cross-reference this paper to the monographic study.

There are some minor discrepancies between the two papers regarding the author citations for *Calotropis gigantea* and *Calotropis procera*. Rahman and Wilcock give "*C. gigantea* (L.) R.Br. in Ait.f." and "*C. procera* (Aiton) R.Br. in Ait.f.", whereas I give "*C. gigantea* (L.) Ait.f." and "*C. procera* (Ait.) Ait.f."

Although I did not spell it out at the time, according to Brummit (1984) and subsequently

supported by Nicolson *et al.* (1988), any names published in the 1811 *Hortus Kewensis*, unless directly attributed to other authors, should be considered as published by the Aitons.

References

- Brummit, R. (1984) Report of the Committee for Spermatophyta: 27. *Taxon* 33: 297-301.
- Forster, P.I. (1992) A taxonomic account of the genus *Calotropis* R.Br. (Asclepiadaceae) in Australia. *Nuytsia* 8: 201-208.
- Nicolson, D.H., Suresh, C.R. and Manilal, K.S. (1988) *An Interpretation of van Rheede's Hortus Malabaricus*. Regnum Vegetabile 119. Koeltz Scientific Books, Königstein.
- Rahman, M.A. and Wilcock, C.C. (1991) A taxonomic revision of *Calotropis* (Asclepiadaceae). *Nord. J. Bot.* 11: 301-308.

Guidelines for the preparation of requests to the Australian Botanical Liaison Officer at Kew

Prepared by G.P. Guymer
Queensland Herbarium
Meiers Road
Indooroopilly, Qld 4068

The Australian Botanical Liaison Officer is based at Kew to service requests for information from Australian botanists, among other duties. To ensure that the ABLO's time is spent efficiently, the following guidelines should be followed when submitting requests:-

1. The name of the taxon concerned should be cited in full, with a complete citation of the place of publication. All known synonyms and their place of publication should also be cited. In most European herbaria, type specimens are not necessarily under the name of the basionym, but can be found under any one of the synonyms.
2. The details of the type citation should be as per the protologue. Check Stafleu and Cowan's *Taxonomic Literature, Volumes 1-6* (ed. 2) for the location of the type material of the author concerned, and provide this information with your request. This ensures that the liaison officer does not waste time searching herbaria for types that are known to be held in other institutions. If the country of origin of the type is not Australia, and it is not given in the protologue, then please supply this information. This will enable the type to be located more readily.
3. Should you be able to refer to the specimen(s)

requested via a herbarium microfiche (e.g. Smith's Herbarium), then list its reference number. This will facilitate the location of the specimen concerned.

4. For critical examination of specimens, a detailed list of the characters required to be examined and commented on is essential. A list of duplicate specimens that may be at Kew (and/or the sending of duplicates to Kew) for comparison ensures that errors are minimized.
5. Cibachrome prints (A4) of type specimens are available from Kew, but requests should not be exhaustive as these prints are expensive. Colour slides can be readily supplied by the ABLO, and the specimen detail is just as good.
6. Requests for the loan of specimens should be sent direct to the Keeper of the Herbarium. Selection of certain specimens (e.g. syntypes, etc.), for loan can be made by the ABLO, provided that an initial request has been sent to the Keeper. The involvement of the ABLO in compiling a set of syntypes can be of value, as many of these specimens may not be in Type folders. Also, discussion with botanists at these institutions can elicit information about specimens that is not readily obtainable otherwise.

Belladonna, n. In Italian a beautiful lady; in English a deadly poison. A striking example of the essential identity of the two tongues.

Crayfish, n. A small crustacean very much resembling the lobster, but less indigestible.

Laurel, n. The laurus, a vegetable dedicated to Apollo, and formerly defoliated to wreath the brows of victors and such poets as had influence at court.

Oyster, n. A slimy, gobby shellfish which civilization gives men the hardihood to eat without

removing its entrails!

Tsetse Fly, n. An African insect (*Glossina morsitans*) whose bite is commonly regarded as nature's most efficacious remedy for insomnia, though some patients prefer that of the American novelist (*Mendax interminabilis*).

Wheat, n. A cereal from which a tolerably good whiskey can with some difficulty be made, and which is also good for bread.

Ambrose Bierce
The Devil's Dictionary

COMMENTARY

Systematic scientism

Introduction

I write following Dr Morrison's review of Stace's *Plant Taxonomy and Biosystematics* ed. 2 (*Newsletter* 70: 30), particularly in response to the closing remark suggesting that systematic work that is neither molecular nor cladistic may cheerily be dismissed as "stamp collecting".

Systematics is not well served by this attitude.

Systematics

Firstly, the greatest need for systematic botanical work at the end of the twentieth century lies in the third world tropics. Ballooning interest (hardly a "craze") in biodiversity on the one hand, and continuing pressure to fell rainforests on the other urgently require the accurate identification of areas of high endemism and richness in species and communities, and some means of ranking such areas in importance and vulnerability. Only with adequate taxonomic bases (as Dr Morrison pointed out in his editorial in the same issue) can development of forest and national park management practices lead to viable conservation strategies.

Few policy makers are likely to care whether or not forest taxa are paraphyletic or defined by synapomorphy; and so no one in his/her right mind should allow himself/herself to be expected to wait for a cladistic and/or molecular analysis to be carried out before a usable systematic account is provided. In this context, alpha taxonomy (grounded, but not aground, in classical methodology) is far more valuable than the deluxe gas-guzzling models of systematics supposed uniquely to evince "science". If the sort of work that represents the ongoing primary exploration of the world's biota is disparaged in university lecture halls, who will remain to do it?

Secondly, nor is alpha taxonomy equatable with stamp-collecting. Alpha taxonomy (especially in the humid tropics) is an invaluable pointer to biological problems of great potential significance in ecology and evolution that would otherwise remain entirely obscure for decades, or be consigned permanently to the scrap heap of extinction. An alpha taxonomic account cannot seriously be thought to represent a filled page in an album as a *fait accompli*. Only omega systematics could

achieve that cul-de-sac, were omega obtainable, which is thankfully doubtful.

Thirdly, universities have a responsibility to keep systematics (among many disciplines, of course) alive by nurturing new systematists in scientific and philosophical contexts that are broad enough to allow systematics to grow. Simply peddling these trendy methodologies as the only way to go is bound to cause systematics to discredit itself yet again. It not only risks pricing itself out of the market while donning a "scientific" (actually scientific) facade, but also successfully renders itself decreasingly responsive to wider needs.

Molecular data are undoubtedly valuable, but not invaluable nor necessarily essential. A systematics that places molecules on pedestals is violently reductionistic, yet while reductionism is orthodox in biology, it is of highly questionable flawlessness as an approach or world-view. Groundswell from both ends of the continuum of natural sciences – physics and psychology – is one of very well-founded (and decades old) dissatisfaction with reductionism, and biology is in danger of being caught in the rip by blind attachment to the reductionist belief system at the expense of any other. A generation of molecular and cladistic systematists would have the greatest difficulty in responding to a call to holism, and the cry is rising.

That cladism, while perhaps useful in some ways, is not of unlimited application is clearly indicated in groups where it simply fails to work (a clearly articulated example being Geesink's Fabaceae-Millettiaceae); and arch-cladists seem eager to ignore entirely the fact that a number of workers as intelligent as themselves find the method unsatisfactorily founded philosophically.

It would therefore seem healthier for systematists to regard molecular data as just another (important but optional) source of information, and cladistics as just another (significant but optional) method that can be explored.

Classical taxonomy, with its methodology that is rather more ill-defined than inherently limited, contains elements of both reductionism and holism, and is therefore the vital springboard into more strongly crystallized or explicit methodologies embedded in either the holist or reductionist world-view. There is no question that cladism represents an explicit strongly crystallized reductionist methodology. That such has arisen (like phenetics) from classical taxonomy is probably a Good Thing – a

stage in the ongoing development of systematics, though this does not *a priori* mean that cladism (or phenetics) is the "right" methodology or even necessarily a better one. That a reductionist facet of classical methodology has become explicit, however, needs now to be complemented by an explicit holistic approach that is yet to crystallize from classical methodology. Classical taxonomy therefore remains the persistent basis for methodological adaptation is systematics, and is certainly not yet ready for the Old Curiosity Shoppe in university curricula.

I am also dismayed that Dr Morrison is so concerned that the *image* of taxonomy as a subjective and intuitive study does not go down well in the modern technological age. There should be more robust factors than the veneer of appearance to elicit the call for change. This cringe from subjectivity, intuition and the somewhat perjoratively used word "art" is more the mark of scientist than scientist. Science does not exist in a vacuum. Science, Art, Metaphysics, Religion and Mysticism (though not all immediately relevant here) intergrade, and Science itself is much broader than empiricism, reductionism and materialism.

If systematics (especially that systematics incorporating the historical factor of descent), by the very nature of its domain and objectives, spills over from empirical science into the non-empirical, then where and how it does and into what must be honestly exposed and explored, not irrationally eschewed. If subjectivity and intuition are shown to belong (and we *all* know that they are engaged daily, however fleetingly), then they must be embraced and their progress and processes understood. If they can be *shown* not to belong, *then* we seek pure empiricism. Only that self-examination, yet to be conducted, would mark a robust and scientific systematics.

One must not forget that those most rigorous disciplines, mathematics and logic, are entirely subjective. These are fallacies of scientism, not hallmarks of science:— that subjectivity is equated with whimsical notion and that only empirical analysis can rigorously give access to "truth".

Acknowledgements

These thoughts benefitted from comment by L.A.S. Johnson and D.J. Mabberley, though this does not necessarily imply those colleagues' full concurrence.

A. Hay
Royal Botanic Gardens Sydney

Systematic science

Introduction

I decided that I should offer a reply to Dr Alistair Hay's comments for two reasons. Firstly, Dr Hay's comments are clearly carefully-considered and well thought-out, and therefore deserve a considered response rather than simply being ignored. Secondly, he appears, either knowingly or unintentionally, to ascribe to myself certain opinions that I patently don't agree with, let alone espouse in public. My response therefore follows Dr Hay's comments point by point.

Systematics

Firstly, I do not find the fact that much of the work necessarily done by systematists really is "stamp collecting" as in any way being "cheery", to use Dr Hay's term. On the contrary, I find the idea that some of this work has not changed noticeably since 1st May 1753 is frankly appalling; e.g. nearly 250 years have passed, and people still find it necessary to expend hours of energy arguing over trivialities such as the spelling of scientific names!

Secondly, I'm sick and tired of British and American biologists telling me as an Australian that the greatest need for current systematic work "lies in the third world tropics". These people sound, more often than not, very much like they suffer from a collective guilt about their forebears having destroyed the natural biology of Europe, and that they are now trying to compensate for it by adopting a patronizing attitude to what's left of the world's relatively undisturbed biota. Perhaps they should start considering just how much of Australia's *temperate* invertebrate fauna (for example) is still undescribed (and uncollected) before they start making their pronouncements about the tropics. If we don't set the remaining temperate areas as a high priority soon, then they will rapidly follow the tropical biota into never-never land. After all, these areas are not disappearing any more slowly.

Moreover, I do not deny in any way that primary exploration and collection in the tropics, or anywhere else, should be a major priority for policy-makers throughout the world. I do, however, take strong issue with the suggestion that these activities necessarily have anything to do with science. Exploration is for explorers, and collection is for collectors. The people who carry out these activities *may* also be scientists, and there is certainly a strong tradition of success in these fields by people who were also proud to be 'scientists', but

that is another facet of their personality. Systematics, as Dr Hay rightly points out, is a manifold activity.

However, Dr Hay in his discussion seems to be confusing systematics with science, something that I have tried very hard to distinguish in my reviews. My point is quite simple:— not *all* of the activities currently expected of systematists are scientific in the late twentieth century meaning of the word, only *some* of them are. I wished to review (and am continuing to do so) the current text books relative to this *one* aspect of their necessary goals as introductions to the manifold activities of systematics. This review process does not in any way deny (or even comment on, if I can help it) the absolute necessity of the other activities that systematists undertake (and mostly enjoy). I specifically exclude from this comment the petty quibbling about nomenclature that still goes on — this cannot be a necessary or relevant activity in this or any other century, and the fact that our current rules of nomenclature still seem to require it is a blatant condemnation of those very rules.

The books under review, unfortunately, seem to me only to pay lip-service to twentieth-century science — most of the books are firmly rooted in the traditional activities of systematics, not in the activities that modern scientists in other fields would recognize as being a relevant part of the late twentieth century. This seems to me to be a great pity, because systematics is under a greater threat than ever before of being swept under bureaucratic carpets as an unfortunate hang-over from the last century, when science *was* very much in the exploration mould. Systematics needs to be widely recognized as more than just a scholarly activity — it is a relevant and exciting part of modern science.

Dr Hay also rightly points out that many modern policy-makers and managers are not interested in scientific knowledge as such. This is a pity for two reasons. Firstly, these managers are required to make decisions with blatantly inadequate knowledge — they cannot afford to wait until what a scientist would consider is sufficient evidence has been accumulated, before the decision is made. This is reprehensible, but perhaps inevitable — I certainly don't envy the policy-makers their job, because whatever they do is probably going to turn out to be inadequate or mis-directed. Secondly, the managers often seem to expect the scientists to change their behaviour to fit in with what the managers want. Very few of them ever seem to have considered the possibility of exerting any effort in understanding the scientists' point of view. Any change needs to be a reciprocal change.

Thirdly, I entirely agree with Dr Hay that alpha taxonomy is not just "stamp-collecting". It is a great pity that no-one outside systematics appears to agree with us. However, I would argue that most systematists have done little to actively change the perception that others have of our endeavours.

Fourthly, Dr Hay points out that reductionist activities like cladistics and molecular genetics have a great deal to contribute to systematics. He also correctly points that they have their limitations. I would specifically nominate, as examples, that cladistic techniques will almost inevitably fail in any situation where dichotomous evolution has not occurred, and that molecular data only lead to trees showing relationships among genes (or genomes) rather than showing the true phylogeny. I get the impression that Dr Hay does not fully appreciate the sceptical attitude that I personally adopt to all techniques within science:— *all* techniques have limitations, and they are only useful tools within those limitations.

However, Dr Hay also spends considerable time discussing the possibility of holistic activities within systematics, without actually being specific about what these activities might consist of. I presume that this lack of clarity is because he recognizes that these activities are "yet to crystallize from classical methodology". My only possible comment here is that when an explicit methodology along these lines *does* appear, then I will give it the same critical and careful analysis that I have given to every other explicit methodology that I have ever encountered as a scientist. Until that time, however, I will continue to pursue the only explicit (and thus scientifically assessable) methodologies that systematics has so far produced.

Finally, Dr Hay has completely misinterpreted my comments about the image that taxonomy presents to the outside world. My concern is *not* with the mere existence of subjective aspects of taxonomy, since I believe that these exist in *all* scientific activities, not just in *some*, as Dr Hay suggests. What I *am* very much concerned about is that taxonomy is seen by outsiders as *only* being an intuitive and subjective activity. As a university academic mainly involved with teaching ecologists, I come across this attitude all of the time. I believe that this perception needs to be stopped, and the sooner the better. There *are* scientific activities within systematics, and they need to be seen. You can very much judge a book by its cover these days, and we *are* being judged by our appearances.

David Morrison
University of Technology, Sydney

A.S.B.S. Inc. BUSINESS



Fourteenth General Meeting

Minutes of the 14th General Meeting

Sydney, Saturday 28th March 1992

Entrance Forum, National Herbarium,
Royal Botanic Gardens, Sydney.
Meeting opened at 5:48 pm.

1. Attendance: The President, Dr Judy West, welcomed the 28 members and visitors to the 14th General Meeting.

2. Apologies: B. Conn, J. Chappill, A. George, H. Hewson, C. Mihaitch, K. Wilson, Jan Williams, T. Morton, D. Morrison, R. Henderson.

3. Minutes of the 13th General Meeting: The minutes of this meeting, held in Canberra, Tuesday 28th August 1990 were published in the *Austral. Syst. Bot. Soc. Newsletter*. They were accepted — moved J. Powell, seconded M. Henwood.

4. President's Report: The President reported that biodiversity was currently a most important issue and that we should have a role in this both as scientists and as a Society. This role should not only be concerned with inventories: taxonomic research was also an essential aspect.

Last November there was a meeting hosted by the Australian Academy of Science on Biological Collections in which members of ASBS played a major role — the proceedings were recently published in *Australian Biologist*. Recently, the draft paper *A National Strategy for the Conservation of Australia's Biological Diversity*, prepared by the Biodiversity Advisory Committee, has been circulated for public comment. The Fenner Conference on Biodiversity held at the Academy of Science in

early March provided a forum for broad scale discussion of the Strategy. The meeting, jointly hosted by the Ecological Society of Australia and the Department of the Arts, Sport, the Environment, and Territories, was well attended by a wide representation of scientists, industry, and bureaucrats. The workshop format helped many of us understand better the position held by others, and certainly succeeded in providing the Federal Government with some substantial feedback. The draft paper is open for public comment until the end of April, and it is hoped that the Society will put in a submission. In brief, the Strategy adequately presents the present knowledge-base and the current status of biodiversity in Australia, but its deficiencies are in the area of how it will be implemented. It seems pretty clear that, besides individual members being involved, the Society itself will have further involvement in biodiversity and the development of conservation policy over the next few years.

The Society recently held a joint meeting with the New Zealand Botanical Society in Auckland. The abstracts were published in the last *Newsletter*. There was a wide range of papers presented and the meeting was very successful with good contacts being established.

5. Treasurer's Report: This was read by Don Foreman (and is reproduced at the end of this report). It was accepted — moved Don Foreman, seconded Isobel Crawford.

Comments on the Treasurer's report followed.

Dr Briggs requested that the Society thank Don Foreman for keeping the books so well — supported by the meeting.

Postage costs: B. Wiecek commented on discrepancies in postage charges, and that future changes in registered mail conditions will mean an increase in postage.

FASTS: It was agreed that the Society should seek to have material published in the FASTS newsletter. Christa Critchley is the Society's representative in FASTS, and the President is the main contact person. Dr Johnson commented on recent FASTS publicity, and noted that important issues included government policy on various matters, not just whether or not science received funds from government. He suggested that there was a need to be more active on biological concerns, and that the Society should influence FASTS policies more if

possible.

Subscriptions: The President noted that subscriptions currently only just cover the costs of the *Newsletter*, postage, and FASTS subscriptions, and suggested that an increase was necessary. The following motion was put to the meeting: "That subscription rates be increased from \$22 per annum to \$25 per annum for ordinary and institutional membership, with student rates remaining at \$12". The motion was passed — moved J. West, seconded B. Wiecek.

Unfinancial members: The Treasurer noted that subscriptions now came in from September onwards and tailed off in March. Suggestions as to how the number of unfinancial members could be reduced were discussed. The President outlined how the Society deals with unfinancial members — they are warned that they are unfinancial in the *Newsletter*, but do not drop off the books until after two years. It was suggested that someone could phone those longer-term unfinancial members to check on whether or not they were interested in continuing their membership.

6. Newsletter Editors report: Presented by Barbara Wiecek.

David Morrison and Barbara Wiecek became editors of the *Austral. Syst. Bot. Soc. Newsletter* in January 1991. They replaced Michael Crisp and Barbara Barnsley, who had held the position for three years, during which they had produced a newsletter of high professional standard.

There were a few minor "teething" problems in the first part of the year as we learned new skills: David had to learn the intricacies of desk-top publishing, and Barbara how to co-ordinate illustrators, book publishers, printers, reviewers and last, but far from least, Australia Post. Fortunately, Barbara Barnsley had left all her files in good order, and left very clear instructions about how to solve particular recurring problems (particularly with respect to the physical production and mailing of the *Newsletter*), making our task a relatively easy one.

Apart from the odd tardy book reviewer (there are *still* two outstanding from before we took over), we have not had to canvass for articles — a steady flow of contributions has appeared each quarter. The length of the newsletter has varied between 32 and 44 pages (medium to long in *Newsletter* history terms). Late contributions can cause headaches, but so far we have managed to distribute each edition before the end of the month in which it is due.

An index to the first 30 issues of the

Newsletter was produced and distributed with the December issue of the *Newsletter*. The index to the next twenty issues is in production, and is expected to appear in the first half of 1992.

We would like to thank all those people who contributed towards the *Newsletter* in 1991.

7. Fund raising activities: It was noted that there had been no recent major drive to raise funds, and it was suggested that there was a need to advertize the publications and other merchandise available in the *Newsletter*. Also, items for sale should be distributed to chapter conveners.

It was also considered important to try to increase membership, as numbers had remained fairly constant over the last few years. The Council was proposing to produce an A4 coloured brochure to use for publicity; Gordon Guymer was taking responsibility for this. John Clarkson suggested that a concerted effort should be made to interest students.

8. Research fund report: This stands at \$2,741.76 as at 27/3/92. It was agreed when the fund was set up that 50% of the profits from funds raised from the sale of t-shirts, mugs and other items should be invested in the research fund account, while the other 50% was to be invested in the general Society funds. Once the costs incurred in producing the items for sale had been recouped, additional funds raised would then be totally invested in the Research account. Any donations specifically for the research fund would be invested in that account. It was also agreed that the interest only would be used from the investment account once it had reached \$5,000. Funds have been raised through the sale of merchandise, and a number of donations have been made. The Society wishes to thank all those who have supported it through their generous donations and assistance throughout the year.

9. Future ASBS meetings: The Society will be involved in a number of meetings over the next two years:-

(a) Hawaii August 1992 — American Botanical Society — six members are going, and are giving papers. The National Tropical Botanic Gardens is a co-sponsor of the symposium, and is supporting the ASBS attendance.

(b) Tasmania January 1993 — "Southern Temperate Ecosystems: Origin and Diversification" — this is a joint meeting of ASBS, ESA and a newly formed group, Southern Connection. Bob Hill, University of Tasmania, is the convener. ASBS

has donated \$1,000 to this meeting so far, and Council decided that a further \$2,500 should be made available to assist ASBS-nominated overseas speakers to attend the Tasmanian Meeting.

(c) **Perth August 1993** — this is a planned ASBS meeting on the topic of conservation, to be held at the University of Western Australia.

(d) **Northern Australia / Atherton 1994** — Judy West suggested that a northern area, such as Mareeba or elsewhere on the Atherton Tablelands, or further north, would provide a good venue for a future meeting, as the last meeting held in the north was the Wet Tropics Symposium in 1986. Any other ideas should be forwarded to Council members.

10. Constitution: The Society is incorporated in the Australian Capital Territory, and recently the A.C.T. Government has changed its legislation concerning incorporated associations. Annual general meetings are now required, which will affect the terms of the Society's office bearers, and various other minor changes have to be made to the Society's constitution. The changes have to be made within 15 months from January 1992, so voting on the changes must take place at the next General Meeting. A Constitutional Sub-committee has been set up with Rod Henderson as chairman, Gordon Guymer and Barry Conn as members; they will put proposals into the next *Newsletter* for comment. It is proposed that minimal changes should be made.

11. Other business: This General Meeting was held in conjunction with a PATN Workshop, which was proving to be very worthwhile. The President thanked Dr Briggs for making the National Herbarium of New South Wales available for the workshop and meeting.

12. Council elections: The following people were declared elected:-

President:	Mike Crisp
Vice President:	Gordon Guymer
Secretary:	Barry Conn
Treasurer:	David Bedford
Councillors:	Jeremy Bruhl Tim Entwisle
Public Officer:	Jeremy Bruhl

The in-coming President, Mike Crisp, proposed a vote of thanks to the outgoing council members. He commented that Judy West had been a very dynamic President, and thanked her for the

contribution that she had made to the Society. He said that while President he will foster student membership as a special issue.

The meeting closed at 7.30 p.m.

B.J. Conn
Secretary, ASBS Inc.

Treasurer's report for the financial years ended 31 December 1990 and 1991, and January/February 1992

Audited summaries of Receipts and Payments for the period from 1 January 1990 to 29 February 1992 are attached to this report. These summaries together with a copy of this report will be lodged with the Department of Corporate Affairs in Canberra.

Membership of the Society: At the present time the Australian Systematic Botany Society Inc. has 350 members in Australia, including 12 full-time students, and 30 overseas.

Income: The Society's main source of income continues to be subscriptions from members. This yielded \$10,036.59 for the year ended 31 December 1990, \$4,326.32 for the year ended 31 December 1991, and \$3,379.37 up to 29 February 1992.

Interest from Term Deposits and the cheque account amounted to \$2,486.63 in 1990, and \$1,760.96 in 1991.

Other income came from sales of *Flora and Fauna of Alpine Australasia*: \$334.00 over the whole period, and *Evolution of the Flora and Fauna in Arid Australia*: \$403.44 over the whole period, remembering that only a percentage of this actually comes to ASBS (see assets list). The sale of the *Newsletter* netted \$653.20 during 1990/1991. Sale of the book *History of Systematic Botany in Australasia* has so far shown a return of \$3,992.48 to the Society (proceeds less costs are shared on a pro rata basis with other financial contributors), so we are just short of the half-way mark to cost recovery.

Sale of various items such as mugs, t-shirts, sweat-shirts, etc. have netted \$1,205.50, half of which has been transferred to the Research Fund. Numerous direct, and sometimes quite generous, donations to the Research Fund now see a total of \$2,709.00 in this investment account. In addition

to this account, the Australian Systematic Botany Society had deposits of \$21,183.07 at the Bank and \$11,400 on Deposit, as at 29 February 1992.

Subscriptions: Late payment of subscriptions have become less of a problem, with reminder notices being sent out to members in the *Newsletter*. As of the present time, a total of 137 people have not paid their 1992 subscriptions, and of this number 20 are also in arrears for 1990. At this stage I would like to formally apologise to all those people who have been offended by getting reminder notices when they had already paid.

Expenses: Production costs associated with the *Newsletter* continue to be our major expense, totalling \$4,274.06 for 1990 and \$5,873.33 for 1991. In 1992 costs associated with the *Newsletter* have amounted to \$1,386.00.

Another major recurring expense is the subscription to FASTS, being \$1,444.00 in 1990 and \$1,320.00 in 1991.

The cost of production of the *History* book was helped with private contributions totalling \$15,900. The balance of the printing cost (i.e. \$23,914.10) was met by the Society. Thanks go to all concerned.

Other major costs during the period were associated with the production of mugs, t-shirts, and sweat-shirts to assist with the research fund (\$4,777.50). In 1991 an amount of \$600.00 was provided to assist three members to travel to New Zealand for the conference held there.

CSIRO Journals: I would urge members who now take advantage of the offer made by CSIRO to

obtain their journals at a reduced rate through the Society to make sure that their subscriptions are paid on time. A notice is put in the September *Newsletter* about current rates. The idea is for one cheque to go to CSIRO with the renewal notice — this year I think we had two or three goes.

FASTS: The subscription rate to FASTS is now \$4.00 per member per year. Since many of us are not politically active, this seems to be good value to have someone pushing our cause. Relevant items are published from time to time in the *Newsletter*, but in view of the cost maybe we should have a regular FASTS column.

Farewell and thanks: Since I took over the position of Treasurer in July 1986 I have had the opportunity of meeting many ASBS members. This has given me great personal pleasure. I must say that the job has changed somewhat in the last few years, juggling income from several sources and making sure that correct payments are made.

I will miss the regular correspondence with members, and I would like to say thankyou for the kind remarks about the Society that many of you have made over the years. It is obvious from these comments that the Society is filling a much-needed role in communicating information, particularly to people with an interest in systematic botany who are not in the mainstream of herbaria or universities.

Finally I would like to wish the new Council well for their term in office.

D.B. Foreman
Treasurer, ASBS Inc.

**Australian Systematic Botany Society Inc.
Statement of Assets and Liabilities up to the Period Ending
29 February 1992**

Assets

At bank: \$21,183.07
In Research Fund: \$2,741.76
On deposit: \$11,400.00

Society Newsletters

Date	Vol.	Stock Unit Price	Date	Vol.	Stock Unit Price
May 1981	27	9	March 1987	50	10
Sept 1981	28	2	June 1987	51	11
March 1982	30	9	Sept 1987	52	9
		\$1.00			\$3.50
		\$1.00			\$3.50
		\$1.00			\$3.50

Sept 1982	32	6	\$1.00	Dec 1987	53	83	\$3.50
Dec 1982	33	9	\$2.00	March 1988	54	10	\$3.50
March 1983	34	9	\$2.00	June 1988	55	9	\$3.50
June 1983	35	9	\$2.00	Sept 1988	56	9	\$3.50
Sept 1983	36	9	\$2.00	Dec 1988	57	9	\$3.50
Dec 1983	37	9	\$2.00	March 1989	58	9	\$3.50
March 1984	38	9	\$3.00	June 1989	59	9	\$3.50
June 1984	39	9	\$3.00	Dec 1989	61	9	\$5.00
Sept 1984	40	9	\$3.00	March 1990	62	9	\$5.00
Dec 1984	41	9	\$3.00	June 1990	63	8	\$5.00
March 1985	42	9	\$3.50	Sept 1990	64	23	\$5.00
June 1985	43	9	\$3.50	Dec 1990	65	11	\$5.00
Sept 1985	44	9	\$3.50	Mar 1991	66	9	\$5.00
Dec 1985	45	9	\$3.50	Jun 1991	67	9	\$5.00
March 1986	46	9	\$3.50	Sept 1991	68	9	\$5.00
June 1986	47	10	\$3.50	Dec 1991	69	10	\$5.00
Sept 1986	48	11	\$3.50	Jan 1992	Index 1-30		\$5.00
Dec 1986	49	10	\$3.50				

Evolution of the Flora and Fauna in Arid Australia

Approximately 220 books left in stock. Unit price \$20.00

ASBS get 5/63 of the proceeds

History of Systematic Botany in Australasia

640 books in stock. Unit price to members \$40.00. Cost price \$24.00.

ASBS gets a *pro rata* share of 33.51%.**Liabilities****Unfinancial members****Australia:**

104 Owing 1 year's subscription	\$22.00	\$2288.00
18 Owing 2 year's subscription	\$44.00	\$792.00

Overseas:

13 Owing 1 year's subscription	\$22.00	\$286.00
2 Owing 2 year's subscription	\$44.00	\$88.00

History of Systematic Botany in Australasia

Unpaid Invoices: \$558.60

Don Foreman

Treasurer, ASBS Inc.

Australian Systematic Botany Society Inc.
Statement of Receipts and Payments for the Year Ended
31 December 1990

Receipts**Interest Received**

On Cheque Account	376.06
Term Deposits	<u>2110.57</u>

2486.63

Redemption of Term Deposit

4000.00

Subscriptions to ASBS Inc.

10036.59

CSIRO Journal subscriptions on behalf of members

1580.00

Sales of History Symposium Book	8722.40
Sales of Alpine Symposium Proceedings	166.00
Sales of Arid Zone Zone Symposium Proceedings	192.00
Sales of Newsletters	435.60
Contributions to Publication of History Book	15900.00
Donations to Research Fund	239.00
Sale of T-shirts, Sweat-shirts, Mugs etc.	539.00
Advertisement in Newsletter	<u>50.00</u>
	\$44347.72

Payments

Printing Newsletters		
61	690.00	
62	730.00	
63	650.00	
64	<u>800.00</u>	
		2870.00
Typing Newsletters		
61	54.00	
62	84.00	
63	<u>72.00</u>	
		210.00
Postage of Newsletters		
61	207.00	
62	151.76	
63	157.04	
64	<u>220.26</u>	
		736.06
Printing of Envelopes		408.00
Post office Reistration Fee		50.00
General Postage		86.00
Postage Canberra Book Sales		120.55
Receipt Books and Postage Treasurer		23.85
Postage and Packing History Books		879.40
Payment of Members' CSIRO Journal Subscriptions		2970.00
Bank Charges		
FID	15.33	
FDT (GDT)	20.45	
Fee on Returned Cheque	<u>7.00</u>	
		42.78
Returned Cheque		22.00
FASTS Subscription for 1990		1444.00
Audit Fee 1989		180.00
Printing of History Book		23914.10
M. Coode for Willi Hennig Conference		148.00
Tour Host Pty Ltd (M. Coode)		49.00
Purchase of T-shirts, Sweat Shirts and Mugs		4777.50
Donation to Royal Society of Tasmania for		
Winifred Curtis Volume		500.00
Sticky address labels		176.50
Transfer to Research Fund	154.00	
	<u>200.00</u>	
		354.00
First Returns on History Book		
P. Short	1743.87	
W.R. & R.M. Barker	1011.26	
M. Gibson Trust	<u>1263.93</u>	
		4019.06

Redemption of Term Deposit	4000.00
Corporate Affairs Filing Fee	17.00
Purchase of Common Seal	16.40
Nancy Burbidge Memorial Lecture - R. Schodde	<u>100.00</u>
	\$48114.20

Summary of Bank Account Movements

Balance at 1 January 1990	19255.92
Add Receipts for Year	<u>44347.72</u>
	63603.64
Less Payments for Year	<u>48114.20</u>
Balance at 31 December 1990	\$15489.44

Summary of Bank Fixed Deposits

Balance at 1st January 1990	11400.00
Add Additions during Year	<u>4000.00</u>
	15400.00
Less Redemptions during Year	<u>4000.00</u>
Balance at 31st December 1990	\$11400.00

D.B. Foreman
Treasurer, ASBS Inc.

Auditor's Report

I report to the members of the Australian Systematic Botany Society Inc. that I have examined the above Statement of Receipts and Payments for the year ended 31 December 1990 and confirm that is in accord with the books and records of the Society.

J.A. Kellet
Chartered Accountant
Corio, Victoria
26 March 1992

Australian Systematic Botany Society Inc. Statement of Receipts and Payments for the Year Ended 31 December 1991

Receipts

Interest Received		
On Cheque Account	498.62	
Term Deposits	<u>1262.34</u>	
		1760.96
Subscriptions to ASBS Inc.		4326.32
CSIRO Journal Subscriptions on behalf of members		2590.00
Sales of History Symposium Book		4344.30
Sales of Alpine Symposium Proceedings		168.00
Sales of Arid Zone Zone Symposium Proceedings		211.44
Sales of Newsletters		217.60
Return from Canberra Symposium		5634.63
Donations to Research Fund		267.00
Sale of T-shirts, Sweat-shirts, Mugs etc.		651.00
Advertisement in Newsletter		100.00

Excess payment for Newsletter

63.50
 \$20334.75
Payments

Printing Newsletters

65	880.00
66	980.00
67	854.00
68	<u>1159.00</u>

3873.00

Typing Newsletters

66	100.00
67	70.00
67 & 68	78.00
68	<u>50.00</u>

298.00

Postage of Newsletters

65	201.26
66	141.72
67	140.00
68	216.90
69	<u>153.00</u>

852.88

Printing of Envelopes

411.95

Checking Index to Newsletters 1 to 30

325.00

Post office Reistration Fee

112.50

Assistance to members attending conference

in New Zealand

(3 @ \$200.00 each)

600.00

General Postage

89.90

Postage Canberra Book Sales

67.40

Refund on Newsletter Purchase

4.50

Refund on History Book Purchase

24.00

Postage and Packing History Book

768.40

Payment of Members' CSIRO Journal Subscriptions

2500.00

Bank Charges

FID 12.65

FDT (GDT) 15.90

28.55

FASTS Subscription for 1991

1320.00

Donation to Symposium on Biological Collections

1000.00

Newsletter Inserts

73.04

Transfer to Research Fund

653.00

Second Returns on History Book

P. Short 856.60

W.R. & R.M. Barker 496.58

M. Gibson Trust 620.72

1973.90

Artwork for Cover of Newsletter

150.00

Return to Peacock Publications and W.R. Barker

Canberra Sales of Arid Zone Proceedings

680.00

\$15806.02

Summary of Bank Account Movements

Balance at 1st January 1991

15489.44

Add Receipts for Year

20334.75

35824.19

Less Payments for Year

15806.02

Balance at 31 st December 1991

\$20018.17

Summary of Bank Fixed Deposits

Balance at 1st January 1991	<u>11400.00</u>
Balance at 31st December 1991	\$11400.00

D.B. Foreman
Treasurer, ASBS Inc.

Auditor's Report

I report to the members of the Australian Systematic Botany Society Inc. that I have examined the above Statement of Receipts and Payments for the year ended 31 December 1991 and confirm that is in accord with the books and records of the Society.

J.A. Kellet
Chartered Accountant
Corio, Victoria
26 March 1992

Australian Systematic Botany Society Inc. Statement of Receipts and Payments for the Period Ended 29 February 1992

Receipts

Subscriptions to ASBS Inc.	3379.37
CSIRO Journal Subscriptions on behalf of members	225.00
Sales of History Symposium Book	544.54
Donations to Research Fund	251.00
Sale of Items for Research Fund	<u>15.00</u>
	\$4403.91

Payments

Printing Newsletter	
69 and Index to Nos. 1-30	1342.00
Typing Newsletters	
69	44.00
General Postage	51.90
Postage Canberra Book Sales	10.88
Purchase of Act and Regulations	10.00
Postage & Stationary Treasurer	41.74
Vic ASBS Running Costs	50.00
Payment of Members'CSIRO Journal Subscriptions	2000.00
Bank Charges	
FID	2.17
GDT	<u>1.20</u>
	<u>3.37</u>
	\$3559.89

Summary of Bank Account Movements

Balance at 1st January 1992	20018.17
Add Receipts for Period	<u>4403.91</u>
	24422.08
Less Payments for Period	<u>3559.89</u>
Balance at 29th February 1992	\$20862.19

Summary of Bank Fixed Deposits

Balance at 1st January 1992	11400.00
Balance at 29th February 1992	\$11400.00

D.B. Foreman
Treasurer, ASBS Inc.

Auditor's Report

I report to the members of the Australian Systematic Botany Society Inc. that I have examined the above Statement of Receipts and Payments for the period ended 29 February 1992 and confirm that is in accord with the books and records of the Society.

J.A. Kellet
Chartered Accountant
Corio, Victoria
26 March 1992

Minutes of the Council Meeting

Sydney, Friday 27th March 1992

Seminar Room, National Herbarium,
Royal Botanic Gardens, Sydney.

1. Attendance: Judy West, Gordon Guymer, Don Foreman, Mike Crisp, Jocelyn Powell, Jeremy Bruhl.

2. Apologies: Barry Conn, Jenny Chappill, Tim Entwisle.

3. Minutes of the Council Meeting held in Canberra on 28 August, 1990: The minutes of the previous council meeting were approved (moved Jocelyn Powell, seconded Gordon Guymer).

Incoming committee members Mike Crisp and Jeremy Bruhl were welcomed by the President.

4. Treasurer's Report: The Treasurer's report was read by Don Foreman and accepted by the meeting (moved Don Foreman, seconded Gordon Guymer). The following aspects were discussed:-

Membership of the Society: It was noted that there has been very little net increase in the last few years.

Unfinancial members: 20 persons were owing two years' subscriptions; it was decided that they should be sent a notice. [Action: David Bedford].

Donations: From Don's report it is clear that we have had some good donations — the people who have supported the Society should be thanked

(in general) in the next *Newsletter*. [Action: Joc Powell to make sure something is in the minutes of the General Meeting which will be published].

Newsletter costs: These have gone up since the *Newsletter* production has been moved to Sydney. Whether or not there should be an increase in the price of the *Newsletter* was discussed, but it was noted that if the cover price of the *Newsletter* rose above \$5 then postage would increase. It was estimated that the cost of individual issues of the *Newsletter* is currently about \$3.00.

Profit from meeting in Canberra: \$5634.63 was the return from that meeting. It was considered that these funds should be earmarked for the support of future meetings, less \$644 which should go to the Research Fund.

The Council thanked Don Foreman for all his hard work as treasurer.

5. Newsletter Editors' Report: This will be presented to the General Meeting on Saturday evening. The Council considered that the editors were doing a very good job.

6. Meetings/Symposia since 1990: The Society has been involved with the following meetings since 1990:-

(1) Biological Collection Meeting — donated \$100 to meeting.

(2) ASBS / New Zealand Botanical Society joint meeting in Auckland, New Zealand — the Society supported the attendance of three people to the extent of \$200 each; this was the first time that the N.Z. Botanical Society had organized a Meeting

as most of their business is done through newsletters. The Meeting was considered successful and good contacts were established.

(3) Fenner Conference on Biodiversity — this was held in March 1992 at the Academy of Science, Canberra. There was only one person invited, but about six members attended. The aim of the Conference was to provide a forum for the development of advice to government. [Action — Judy to write up for next *Newsletter*].

Written submissions will be accepted until the end of April, and it was considered that the Society should make a submission [Action: Judy to coordinate].

7. Future Meetings:

(a) Hawaii — August 1992 — six members are going and giving papers — the National Tropical Botanic Gardens are supporting the ASBS attendance.

(b) Tasmania — January 1993 — Bob Hill is organising this — \$1000 has been paid out from ASBS so far. An application is to be made to DITAC for International Conference Support. [Action — Judy West & Bob Hill].

(c) Perth — August 1993 — to be held at the University of Western Australia. [Action — Mike to check up on what is happening].

(d) Judy West suggested the a northern area, such as Mareeba/Atherton would provide a good venue for a future meeting. [Action — Mike to talk to Bernie Hyland and John Clarkson and also to Peter Hitchcock of the Wet Tropics Agency] — the meeting could be sponsored jointly by Queensland and Federal agencies.

(e) the Genetics Society of Australia has inviting ASBS to join them in a planned July 1998 international meeting — they are expecting 2000+ overseas delegates. C.B. Gillies is the contact at Sydney University. [Action — Judy to respond to say we are interested and then hand over the matter to Mike Crisp].

Funding for Tasmanian Meeting: It was considered that the Society should support people coming from South America, and suggested that the initial \$1000 paid out be considered as a donation and that a further \$2500 should be set aside to assist. The following motion was put to the Council: "That up to \$2500 is to be put towards travel to assist ASBS-nominated overseas speakers to attend the Tasmanian Meeting in addition to the \$1000 already donated." (moved Mike Crisp, seconded Judy West). [Action : Judy West to write letter to Bob Hill].

8. History Symposium Publication: It was suggested that this publication be given a further push in the next *Newsletter* and also be offered to SGAP members at the basic price of \$40. [Action: Don Foreman to provide information to David Bedford and Barry Conn.]

9. FASTS: Mike Crisp will take over as the contact for our FASTS representative at meetings; our representative is Christa Critchley. It was considered that the Society should remain in the group and provide material for a column in their *Newsletter* if possible. [Action — Jeremy and Mike].

10. Biological Council of Australia: it was not known what was happening re this.

11. Research Fund: This stands at \$2741.76 as at 27/3/92. It was agreed when the fund was set up that there would be a 50:50 split of any funds to a research fund investment account (set up by the Treasurer) and a cheque account fund, and that the interest only be used from the investment account. The use of this research fund was discussed, the main suggestion being to help students to travel to attend meetings and present systematic papers. But it was pointed out that this could be done from the general funds anyway. The matter was left for the new Council to consider. [Action — new Council to consider.]

Fund raising — it was not known what the current situation was with regard to this. [Action — Mike Crisp to check with Helen Hewson what has been happening.]

12. Subscriptions & methods of payment: Currently subscriptions only just cover the costs of the *Newsletter*, postage, and FASTS subscriptions. It was recommended that General Subscriptions be increased to \$25, Students remain at \$12 — this would be put to the General Meeting on Saturday night.

13. Publicity of Society: a single A4 page coloured flyer is to be produced to publicize the activities of the Society. Cost of c. 2000 copies was estimated as possibly \$1500; Gordon Guymor offered to design this and get it printed.

14. Local ASBS Chapters: some local chapters were active, particularly Brisbane and Melbourne, and in Canberra there had been 2 or 3 meetings held jointly between ASBS and AES; Jeremy suggested that there should be periodic updates provided by the local conveners.

15. Archives: Barry has been working on these, and has nearly completed the job.

16. Index to Newsletters 1-30: a diskette of the rest of the taxonomic names is with David Morrison, as future indexes would be done by the editor following the *Newsletter* format. Gordon suggested that numbers 1-100 should be accumulated for an index (number 70 is being produced currently). It may not necessarily be the editor who would do this, but disks should be kept as a basis for it. Copies of diskettes should be archived in the central archive. [Action: Barry to see David Morrison re this, and all future diskettes to be given to Barry for archiving].

17. Constitution changes: the Society is incorporated in the A.C.T., and recently the A.C.T. Government has passed its own legislation on incorporated associations. Certain aspects have tightened up, and various other minor changes have been made. The Society's constitution will have to be brought into line with these requirements, so the Constitutional Sub-committee comprising Rod Henderson, Gordon Guymer and Barry Conn will have to meet again.

There is a need to get something into the next *Newsletter*, as any changes will have to be approved by the Council and go to the next General Meeting. Changes have to be with the Secretary four months before the General Meeting, so the timing is fairly tight.

18. Public Officer: to be changed — it was suggested that Jeremy Bruhl be nominated to that position.

19. Official letterhead: some progress was thought to have been made on this — Mike to consult with Barry, Judy and Jocelyn.

20. Council elections: the following were elected:-

President:	Mike Crisp
Vice President:	Gordon Guymer
Secretary:	Barry Conn
Treasurer:	David Bedford
Councillors:	Jeremy Bruhl Tim Entwistle
Public Officer:	Jeremy Bruhl

The meeting closed at 8.00 p.m.

B.J. Conn
Secretary, ASBS Inc.

ASBS Constitution and the new A.C.T. Incorporation Act

The A.C.T. Corporate Affairs Commission has written informing the Society that it has passed a new *Incorporated Associations Act 1991*, which will necessitate changes to our constitution, as well to some of our procedures.

1. Annual general meetings

The new Act requires annual general meetings. Our present Constitution specifies that general meetings (before which a new council is elected by ballot of members, if necessary) shall be held "at least once every two years". This flexibility has suited us very well. Our Society is small, dispersed and not rich, and it has not been practical to hold meetings every year. We have tended to tie our meetings in with symposia held by other organisations, such as the Ecological Society of Australia, ANZAAS, and so on. This flexibility will now be greatly reduced, and we may expect that not as many members will be able to get to annual general meetings.

2. Terms of Council

As the term of a Council is to be shortened, it seems sensible to extend the number of terms allowed each Councillor on Council - otherwise, a President would be forced to step down from that position after only two years, and any Councillor after only four. We recommend that Presidents' terms be extended to a maximum of three years and other members of Council to six years, with no member being able to serve more than six consecutive years on Council.

3. Financial statements

Another requirement of the new Act is the annual submission by the Public Officer of an audited statement of our finances. This statement must first be ratified by an annual general meeting (see above). Until now, we have prepared the financial statements annually, but have submitted them only after general meetings, whenever held. Often, this has meant that we have submitted none in a given year. For example, we have not yet made a return for 1991 because there was no general meeting last year.

4. Constitutional changes

We have 15 months (from 1 January 1992) to change our Constitution to comply with the Act. This means that we will have to pass the new Con-

stitution through the general meeting in Hobart next January and vote on it soon after. A constitutional committee has been formed consisting of Rod Henderson and Gordon Guymer, who are investigating the changes required under the new Act.

5. Other requirements

The new Act also requires our rules to state things like the procedure to be followed at Council meetings and at general meetings. These are already covered by our Constitution. However, we should adapt the "model rules" published by the Corporate Affairs Commission to suit the Society. They have more detail on these things than is in our current Constitution. Once accepted, the new Constitution will allow us to change it only by voting at an annual general meeting.

The committee has submitted to members of Council for their comment, a draft constitution which is in accordance with the new Act. This does not differ markedly from our current Constitution in what is prescribed. Once this has been approved by Council it will then be submitted to the Corporate Affairs Commission for their comment. We hope to have copies of the sanctioned constitution enclosed with the next Newsletter. The constitution will then be put to the membership for ratification following the January general meeting of the Society.

M. Crisp, G. Guymer, R. Henderson

Symposium in far north Queensland

For several years there has been an interest amongst members in seeing ASBS hold a symposium in far north Queensland. Those present at the Botanical History Symposium, in Melbourne in 1988, may remember the enthusiastic response to the idea when it was suggested by Philip Short.

Following a meeting with some members of the council after the last general meeting, held in Sydney, a steering committee has been formed to organize such a symposium. At this stage the proposed topic is the origins and evolution of the flora of the monsoon tropics.

The venue will probably be somewhere in the Atherton Tableland, and if there is sufficient interest then a field excursion will be organized. The

date proposed is the week commencing 1 July 1994. This coincides with the vice-chancellors' common week for Australian universities.

The possibility of meeting jointly with another society with common interests is being explored. Further details will be given in the next issue of the *Newsletter*. I would appreciate any comments that members might like to contribute by August 21.

John Clarkson
Mareeba

A.S.B.S. Member Profiles

Mike Crisp
A.S.B.S. President

I suppose I should start at the beginning. I was born . . . at least my mother tells me I was, and I should take her word for it, because she was there at the time. Various events followed that are hardly worth mentioning, so I won't. My first recollection of any interest in plants was the pleasure of lying on my back in the grass in the sun while my mother pegged clothes on the line above. At that time, I was too young to appreciate that it wasn't the grass that gave pleasure so much as what one did while lying in it.

More events passed, and one day I was given a bicycle. Before long, I learned that wheels brought freedom to get up to escapades beyond the restrictive attention of parents. My best mate and I discovered the fun of using our bikes to round up the sheep in the local park, until a furious caretaker threw us out. How were we to know that pregnant ewes didn't need that much exercise? So, having to take things more quietly when I returned to the park, I noticed that the trees had little plaques on them. These displayed the names of the plants, in plain English as well as in some foreign language, and they said where the trees came from. Many were from exotic places like New South Wales, which caught my interest, so I collected some fruits, extracted the seeds, and grew them in my father's back garden.

Only later did I appreciate the significance of the "local park". It was the famous arboretum of the Waite Institute, bequeathed to the University of Adelaide by Peter Waite, an enlightened pastoralist pioneer of 19th century South Australia. One of my seeds grew into a magnificent flooded gum, *Eucalyptus grandis*, but it was taken down a couple

of years ago at huge expense, because the neighbour felt nervous with a 30 metre tree towering over his roof. My father's enthusiasm for native plants rubbed off on me too, and eventually I took up his hobby for my job.

So, I suppose I developed an interest in plants early, although when I started university some years later, I was determined to become a chemist. But chemistry became mathematical and dull, and I wasn't allowed to mix up those wonderful exploding concoctions that I had made with my £5 chemistry set. I took up biology, which reawakened my latent interest in native trees, and I went on to study botany in second year. I quickly became interested in identification and classification, mainly through a plant collection project and a "species study" project.

Our taxonomy lecturer, Constance Eardley, was earnest, warm, hard-working and possessed a wickedly dry sense of humour, but was utterly erratic and disorganized. After decades of experience, she was still nervous giving lectures, and sadly out of touch (this was the age of phenetics and chemosystematics, but these topics were scarcely mentioned). I learned two things from her: - that one shouldn't use pages from *Truth* in a plant press because they are liable to singe the plants (most of the class dutifully wrote this down); and that her back garden was a jungle of gourds, melons, cucumbers and loofahs.

Her room was a jungle too. It must have taken eons to build up those teetering piles of books, newspapers, boxes and half fossilised specimens, all elaborately tied in bundles with ribbons and labelled in elegant spidery handwriting. Dave Christophel inherited this room, and he tried valiantly to maintain its unique condition but ultimately failed. Perhaps the problem was that his fossils were real, not created by an expert. One important thing I have learned since becoming an academic is to uphold the standards set by one's predecessors.

Con Eardley made a wonderful contribution to botany by continuing the Koonamore Vegetation Reserve records when everybody else had forgotten them. Thanks largely to her, Koonamore (renamed the T.G.B. Osborn Vegetation Reserve, after its founder) is renowned as the world's outstanding long-term series of vegetation observations. However, doing an honours degree with her seemed impractical. Among the most inspiring lectures I had had as a undergraduate were those in ecology. They were delivered by Rod Rogers, at that time a Ph.D. student whose supervisor, Bob Lange, was away on sabbatical. Bob had asked Rod to give his second-year lectures. Rod later

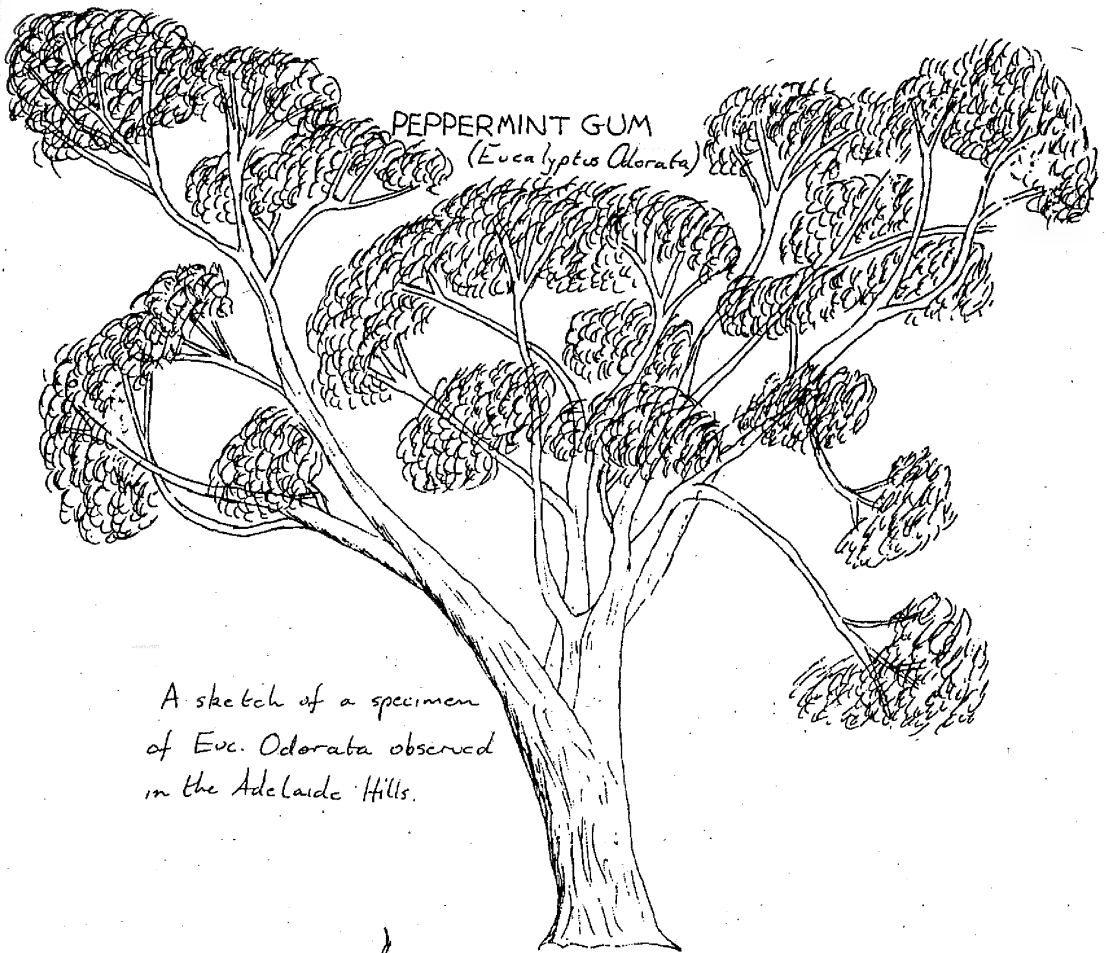
confessed to me that he was so nervous at first that he had to hold on to the lectern to keep himself upright. Perhaps because of this he worked extra hard at his teaching; whatever the reason, his lectures were up to date, interesting and inspired me to do honours in ecology. Another lesson I have learned since becoming an academic is that to avoid being upstaged, one should not arrange for a postgraduate student to give one's lectures when one is away.

My choice of ecology for postgraduate studies was totally illogical because: (i) I had majored in biochemistry, systematics and developmental botany as an undergraduate, (ii) Rod had gone back to his Ph.D. project and was not available to supervise me, and (iii) I preferred systematics anyway. Nevertheless, I went on to do a Ph.D. study on vegetation change at Koonamore.

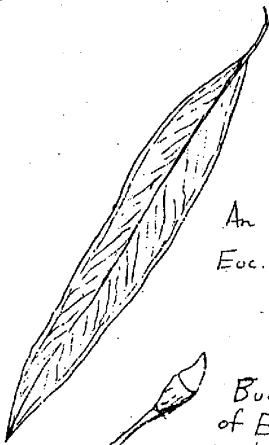
One day, to relieve the tedium of poring over quadrats, I decided to explore the blue line of hills that I could see stretching away to the north every time that I straightened up to relieve the pain in my knees and back. On the top of one peak I found a plant that wouldn't key out in Black's *Flora*, although it was clearly a *Daviesia*. I was amazed that one could discover a species unknown to science so easily; and that incident revived my interest in taxonomy. Little did I know that I had just started a long-term research interest in Fabaceae. I began to make regular visits to the State herbarium of South Australia, where I pestered Hansjörg Eichler and his staff about this and other plants that I had collected.

Upon graduating, I immediately resolved to switch to systematics. Unfortunately, my complete lack of credentials in the field presented a major difficulty. So, I applied for jobs for which I was qualified, and was appointed as an ecologist at the (then) Canberra Botanic Gardens. The advertisement for the job said something about studying the ecological requirements of native plants in the field with a view to reproducing the right growing conditions for them in the gardens. On my first day I was astonished to find out that the advertisement had been a charade. They really wanted a taxonomist, but due to a ministerial decree, the Botanic Gardens was not allowed to visibly engage in taxonomic research. During the interview I apparently impressed them with my knowledge of and enthusiasm for taxonomy, so I got the job. Unexpectedly I had found my vocation, and I began my career as a systematist.

During the next decade or so I did many things at the Australian National Botanic Gardens (as it now is), but I hesitate to describe them in detail



A sketch of a specimen
of *Euc. Odorata* observed
in the Adelaide Hills.



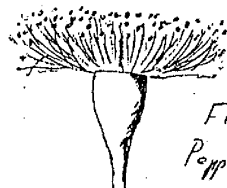
An adult leaf of
Euc. Odorata



Bud of flower
of *Euc. Odorata*
(when young)



Fruit of the
Peppermint Gum



Flower of
Peppermint Gum

Some early taxonomic work by the 14-year-old Michael Crisp. Accurate except for the capital letter in the specific epithet.

because most of the people involved are still alive and working just across the road from my office. One thing that I learned while working there was the name of my section, branch and department of the public service. This was important because I had to learn the name of a new section, branch and department 26 times (or was it 27?). Eventually they transferred the ANBG out of the public service (and into the Australian National Parks and Wildlife Service) because they ran out of paper for printing new letterheads.

However, I was lucky to have the opportunity to work away quietly and relatively undisturbed in a herbarium environment over a long period. This allowed me to build a career in systematics from scratch. My stint at Kew as ABLO, especially working on legumes with the energetic and knowledgeable Roger Polhill, was a fillip to my research. I came back inspired to revise the whole of the *Mirbelieae*, the large endemic Australian tribe of "egg and bacon" legumes, including more than 500

species and 30 genera. Since then, I have realised that a rather smaller chunk of this group will more than keep me busy for a long time, but the influence of Kew and Roger on my research persists.

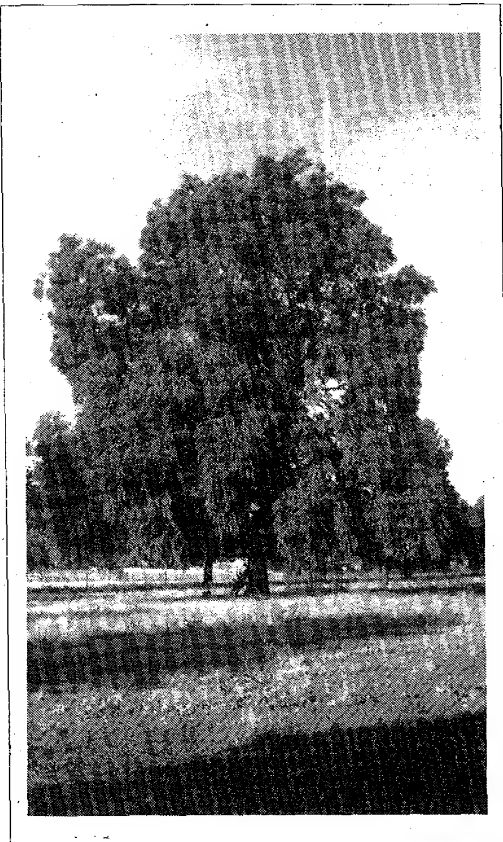
Feeling a desire to diversify my interests, I moved to the Australian National University last year. Although initially unsure about taking up teaching in mid-career, I have been pleased to find it enjoyable, as well as broadening my knowledge of biology. The teacher probably learns more than the students — they have to be one step ahead.

My research has certainly benefitted from the move. I have expanded my interests into genetics (e.g. problems of speciation) and molecular techniques. This year I have been working with Rudi Appels at CSIRO, sequencing 5S ribosomal RNA genes, which I hope will help to resolve some perplexing problems of generic delimitation in the *Mirbelieae*. It is clear from developments overseas, especially in the USA, that DNA techniques are going to revolutionize our knowledge of relationships among taxa. With Rudi's help, I plan to run a workshop on these techniques in Canberra in the summer of 1994.

However, I have not forgotten my roots. Morphology will continue to be the mainstay of plant taxonomy generally as well as of my own work. Morphological characters are more accessible than molecules, cheaper to observe and easier to put into keys. Also, they represent a much broader sample of the genome than a few genes. I have found that taking a class into the bush with plant presses and simply collecting and identifying plants, is the most enjoyable aspect of my teaching.

I have heard much rumbling in recent years about the decline in support for systematics. Certainly times are tough, but relative to the rest of biology, I see signs of a resurgence in our field. I can think of seven Australian universities that have been appointing plant systematists during the last couple of years. My own position is the first lectureship in plant systematics in the history of ANU. The public is conscious of the "biodiversity crisis" and I hear students expressing concern about it. We must ride this wave and convince the decision makers that our contribution is essential if species are to be saved.

As a teacher, I am aware that our profession and our society depend for their survival upon a flow of new blood. We must support and encourage students, especially post-graduate students, to join the society and continue as systematists. While president of ASBS, I want to explore paths for achieving these aims.



Angophora floribunda in the Waite Arboretum, against which is leaning the bike used by the young Michael Crisp to chase sheep.

REPORTS



Australian Botanical Liaison Officer

Requests keep coming in, and I've attempted to reply to all of them within a week of receipt. I have, however, been away working in Edinburgh and holidaying briefly in Orkney — where I was thrilled to finally see some bird cliffs with thousands of kittiwakes, fulmars, razorbills, guillemots, and the odd puffin — so answers to some recent requests may be taking a bit longer than expected. There may also be brief delays in early July, as, after a trip to Geneva to examine daisies in the De Candolle Herbarium, I plan to spend some annual leave in the Alps.

I returned yesterday from an enjoyable three days in Stockholm, where I was working with Arne Anderberg. If all goes according to plan, then the odd cladistic analysis of the groups of Australian daisies will be turning up in the next few years.

A squash report may be of no interest to anyone except Greg Leach. However, I can finally report a hard-fought win over Brian Matthew. The problem now is Craig Hilton-Taylor (the South African Botanical Liaison Officer). Brian and I are starting to think that South Africa should not have been allowed to re-enter the international sporting arena!

Since I don't have a lot of general Kew news to report, I'd like to take this opportunity to give a plug for some of the many excellent publications that emanate from here. Most readers are probably aware that Dick Brummitt's *Vascular Plant Families and Genera* is now published. Of other publications, Mike Lock tells me that, as I write this, *Authors of Plant Names ...* (eds R.K. Brummitt and C.E. Powell) is being printed and folded. It then goes to Wales for binding, and the final product should be available on or about 10 July. *Advances in Legume Systematics. Part 4. Fossil*

Legumes is on course for publication by the end of June, in time for the Third International Legume Conference from 12-17 July. A second edition of *The Herbarium Handbook* is likely to appear in August.

Philip Short
Kew



Australian Biological Resources Study

Seventy four applications have been received for ABRS Flora grants in 1993. These are currently going through the administrative and assessment stages, in preparation for the meeting of the Advisory Committee, which this year will be held earlier than usual, on 6-7 August.

A new administrative structure is now in place affecting ABRS. The Australian National Parks and Wildlife Service has been reorganised into five directorates, each headed by an executive director. ABRS is part of the Biodiversity Directorate, which also includes the Australian National Botanic Gardens and the Endangered Species Unit. The Executive Director of the Directorate is Dr David Kay, a marine zoologist by training.

Dr Tony Orchard, who has been curator of the Tasmanian Herbarium for 15 years, has been appointed to the position of Scientific Editor formerly occupied by Helen Hewson, and will take up duty with the Flora unit on 20 July.

We have been fortunate to obtain, for the last few months of the 1991-92 financial year, the services of Jane Mowatt, Barbara Barnsley, and Laurie Adams to assist with editing the *Flora*. Their

sterling work has contributed greatly to the forthcoming resumption of publication of the *Flora*, as outlined below.

Paul Hattersley is still on secondment to the Scientific Audit Unit of ANPWS, where he is involved especially in setting up a Country Study for Australia, under the auspices of the International Union for the Conservation of Nature.

After a two-year break since the previous volume, the *Flora of Australia* is once again about to hit the shelves, with *Volume 35* (Brunoniaceae, Goodeniaceae) now at the printer. A celebration dinner of Goodeniaceous Goodies was held in Canberra on 28 May, in keeping with the now well-established tradition of *Flora* Volume parties. Although not all contributors could be present, we were very pleased to welcome Roger Carolin for the occasion. Jim Peacock, who undertook extensive cytological research in Goodeniaceae, also attended.

The first volume on lichens, *Volume 54*, is well-advanced, and should be ready for launching in conjunction with the Symposium of the International Association of Lichenologists to be held in Lund, Sweden, in August-September. A simultaneous launch will be held in Australia. *Volume 50*, covering the vascular flora of Australia's oceanic islands except Lord Howe and Norfolk (which are in *Volume 49*), will follow, going to press around the end of 1992. The text for *Volume 49* is almost completed.

A Workshop to discuss bringing the algae into the *Flora* program will be held at the National Herbarium of Victoria on 9 and 10 June. Its report and recommendations will go to the *Flora* Editorial Committee for discussion at its 1992 meeting.

In April, Cheryl Grgurinovic attended the biennial meeting of Australasian Lichenologists, held in Hobart. Discussions were held concerning the forthcoming *Volume 54* of the *Flora*, as well as preparations for the later volumes.

Our postal address is:

Flora of Australia,
Australian Biological Resources Study,
Australian National Parks & Wildlife Service,
G.P.O. Box 636,
Canberra, A.C.T. 2601.

Phone number: (06) 250944

Fax number: (06) 250 9448.

Alex George
Flora of Australia

A.S.B.S. Melbourne Chapter

A.S.B.S. Melbourne Chapter seminars are held at 6 pm on the first Monday of each month.

They are held at the Astronomer's Residence, behind La Trobe's Cottage, in the Royal Botanic Gardens. This is 100 m west of the National Herbarium of Victoria, corner of Birdwood Ave and Dallas Brooks Dve, South Yarra.

Refreshments are available from 5.30 pm. All members and visitors are welcome.

Seminar Programme, July-November 1992

Monday, July 6

Kim Robinson
Environmental Monitoring & Research Branch,
Department of Conservation & Environment
"Unnatural flora"

Monday, August 3

Vivienne Turner
Department of Ecology & Evolutionary Biology,
Monash University
"Astelia (Liliaceae)"

Monday, September 7

Don Foreman
National Herbarium of Victoria
Royal Botanic Gardens
"Introducing MELISR: the trials and tribulations of databasing Melbourne's herbarium collections"

Monday, October 5

Yvonne Frapp
Department of Genetics & Human Variation,
La Trobe University
"Allozyme studies of endangered Victorian eucalypts"

Monday, November 2

Garry Saunders
School of Botany,
University of Melbourne
"Traditional versus molecular approaches to algal systematics: Initial adversaries, eventual allies"

Further information can be obtained from me on (03) 655-2313.

Tim Entwistle
Convener

A.S.B.S. Adelaide Chapter

A.S.B.S. Adelaide Chapter seminars are held at 8 pm on the last wednesday of each month, in the State Herbarium lecture/tea room at the Botanic Gardens, North Terrace, Adelaide. Members and visitors are welcome.

Seminar Programme, May-August 1992

Wednesday, May 27

Kevin Boyce
Seed Services Branch, Department of Agriculture
"Seed science in South Australia and plant variety rights"

Wednesday, June 24

Mark Hutchinson
South Australian Museum
"Charles Darwin, pioneer herpetologist, in Tasmania"

Wednesday, July 29

Darrell Kraehenbuehl
Native Vegetation Management Branch,
Department of Environment & Planning
"Adelaide's lost flora"

Wednesday, August 26

Tony Whitehill
Botanic Gardens of Adelaide
"Historic gardens in South Australia"

Further information can be obtained from us on
(08) 228-2303

Bill & Robyn Barker
Conveners

Council of Heads of Australian Herbaria

19th annual meeting

CHAH met at the Queensland Herbarium on 8-9 October 1991.

Present were:- Dr J. Armstrong (PERTH), Dr B. Briggs (NSW), Mr J. Croft (CBG), Mr C. Dunlop (DNA), Dr G. Guymer (BRI - Chairperson), Dr J. Jessop (AD), Dr A. Orchard (HO), Dr J. Ross (MEL), Dr J. West (CANB).

Two observers were present:- Dr P. Brownsey

(WELT) representing New Zealand Herbaria, and Mr R. Kiapranis, Papua New Guinea Herbarium.

Dr P. Bridgewater, Director, ANPWS, was present at the meeting to discuss matters pertaining to ABRS, ERIN and the Wildlife Protection Act.

The principal items discussed were:-

1. Index to Taxonomic Literature of Australia: Council had received no response from Kew regarding CHAH's proposal to obtain Kew Record updates on disk.

2. Current taxonomic research in the Australian flora: The Council supported an updated publication on current taxonomic research on the Australian flora. CANB and CBG are to prepare and distribute proforma and compile current information.

3. Central Register of photographs of type specimens held in overseas herbaria: Dr Orchard reported that little progress had been made, due to computing difficulties and incompatibilities in the format of the data received. Dr Orchard would contact herbaria for their data, and preferred data to be submitted as a Microsoft Word file.

4. CITES: CHAH agreed to submit comment on the Wildlife Protection Act under which CITES is administered.

5. Moveable Cultural Heritage Act: The amendments made to this Act now exclude most herbarium collections.

6. Herbarium Specimen Database Project: CHAH requested a workshop between ERIN and the respective herbaria (Council members and database managers) to discuss HISPID standards and data exchange protocols. Dr Bridgewater agreed to this request, and the workshop will be held in April 1992.

7. Flora of Australia: CHAH members expressed their concern at the slow rate of production of the *Flora*. It was felt that there was a lack of flexibility in the format of the *Flora of Australia*, particularly in the Appendix, which was not considered to adequately handle publication of new taxa. CHAH recommended that the text of *Flora of Australia* be computerised, and that the database be maintained and updated.

8. Herbarium resources committed to servicing loan requests: ABRS had agreed to par-

tially fund specimen loans associated with the *Flora of Australia* project. The number of specimens associated with the *Flora* was initially estimated to represent 75% of the requests serviced by herbaria. However, CHAH members believed that all Australian specimen loans were relevant to this project, and that future applications to ABRS would be based on total loan figures for each herbaria.

9. Census of Australian Vascular Plants (CAVP): CBG had been given the task of maintaining and updating the database associated with this Census. There was lengthy discussion concerning protocols for interchange of data, duplication of effort in updating the list, and removing discrepancies between State databases and the centralised database. The interchange of data protocols would be discussed at the April ERIN/HISPID workshop.

10. Australian Plant Name Index (APNI): The *Index* had been published in 4 volumes. CBG has the responsibility for maintaining and updating it.

11. Australian Biological Resources Study (ABRS): ABRS was to be reviewed later in the year. The terms of reference were provided by Dr Bridgewater.

12. Environmental Resources Information Network (ERIN): Dr Bridgewater reported that ERIN was to undergo a review in early 1992. He was hopeful that the concept of ERIN would be endorsed, and that further funding for database projects would be granted.

13. Australian Botanical Liaison Officer (ABLO): Dr McFarlane's ABLO report for 1989-90 was tabled. Dr West reported that a new dissecting microscope from ABRS funding will be purchased for ABLO use at KEW. Council recommended that Mr L.W. Jessup (BRI) be appointed as ABLO for the 1993-94 term.

14. Reports from Herbaria: Members from all of the herbaria represented reported on the activities, news, staff changes and future plans of their institutions.

15. Rare or Threatened Australian Plants (ROTAP): The responsibility for maintaining the ROTAP database was now with the Endangered Species Unit of Australian National Parks and Wildlife Service.

16. Masking distribution information for rare and/or threatened plants in research publications: Council agreed that in publications describing rare/threatened taxa the distributional data should be made vague or without precise locality, and that the bona fides of people requesting access to specimen data, whether in person or electronically, should be checked more rigorously.

17. Herbarium assistants workshop in Sydney, August 1992: Dr Briggs reported that information on the workshop had been sent to Australian herbaria. The content of the workshop was discussed.

18. Representation on CHAH by a representative of the Australian mycological collections: Council agreed that a representative of the mycological collections would be invited to attend the next meeting of CHAH as an observer.

19. Loans of specimens to non-State and non-Commonwealth herbaria: As a general rule, loans of specimens were not made to Universities and to private individuals. However, most members considered each request individually, and based their decision on the reputation and circumstances of the individual or institution.

20. Interim International Organisation for Plant Information (IOPI) and Taxonomic Database Working Group (TDWG) reports: Dr West informed members about the establishment of IOPI. Its first project would be a world checklist of vascular plants. Other projects, including databases, were envisaged.

Mr Croft reported on TDWG. Some standards were ready for publication, and working groups had been set up. Barry Conn had been appointed as the Australian representative.

21. DELTA systems: CHAH agreed to write in support of Dr Dallwitz and his DELTA set of programs to the Chief of the Division of Entomology and to the Director of the Institute of Plant Protection and Processing.

22. Return of holotype material to Australian herbaria: Dr Armstrong raised this matter, due to the provisions of the Movable Cultural Heritage Act, whereby types of new taxa should be returned to Australian herbaria.

It was agreed that, as a general principle, the holotypes or at least an isotype should be housed in the State in which it was collected. Council

members were reminded that there was legal obligation for type plant material to be returned to State herbaria if it was collected from Crown Lands.

G.P. Guymer
Chairperson
CHAH

International Organization for Plant Information

The International Organization for Plant Information (IOPI — see *Newsletter* 69: 24-25) is gathering momentum.

The Working Groups (for Data Definition and Standards; Taxonomic Resources Network; and Information Systems) have been meeting and corresponding, and the Checklist Committee will meet in Leiden on 15 and 16 June 1992.

The next meeting of the Organization will be held in Xalapa, Mexico, from 3–5 November 1992, immediately preceding the next meeting, in the same city, of the International Working Group on Taxonomic Databases for Plant Sciences (TDWG). Registration for the two meetings together is \$US100. Registration forms are available from me at the address below.

Membership

Membership of IOPI consists of Participating Centre (PC) Members, Individual Members, and Invited Members. PC and Individual Members are required to be active participants in the work of IOPI, either as representatives of Participating Centres or as Members in their own right. Invited Members shall be individuals, recognised by the governing body of IOPI, as capable of contributing in some way to the work of IOPI, although not necessarily participating directly in its activities as

such.

Nominations for PC or Individual membership may be submitted in writing by two Members of IOPI, and the names shall be submitted by Council for election at a General Meeting by a simple majority of the Members present. Invited Members shall be nominated by the governing body of IOPI.

There is no membership fee. For the first year, the membership consists of members of the Foundation Council, the Checklist Committee, and the Working Groups, as well as several organizations that participated in the inaugural meeting last September.

Membership of the Foundation Council was given in *Newsletter* 69. Australian members of IOPI are all PCs, with the following representatives or contacts:— Mr Alex George, Australian Biological Resources Study, Canberra (ph. 06-2509440); Dr Jim Croft, Australian National Botanic Gardens, Canberra (ph. 06-2509490; email: jrc@anbg.gov.au); Dr David Green, Centre for Information Sciences, Australian National University, Canberra (ph. 06-2494728); Dr Les Watson, Australian National University, Canberra (ph. 06-2494666); Mr Arthur Chapman, Environmental Resources Information Network, Canberra (ph. 06-2500376; email: arthur@erin.gov.au); Mrs Karen Wilson, National Herbarium of New South Wales, Sydney (ph. 02-2318137); Dr Deidrie Jinks, University of Technology, Sydney (ph. 02-3301826; email: djink@socs.uts.edu.au).

Anyone or any institution wanting further information, or wishing to apply for membership, should contact the Secretary, Alex George, Australian Biological Resources Study, G.P.O. Box 636, Canberra, A.C.T. 2601; fax (06) 250-9448; phone (06) 250-9440.

Alex George
Flora of Australia

Adder, n. A species of snake. So called from its habit of adding funeral outlays to the other expenses of living.

Hyena, n. A beast held in reverence by some oriental nations from its habit of frequenting at night the burial-places of the dead. But the medical student does that.

Magpie, n. A bird whose thievish disposition suggested to some one that it might be taught to talk.

Pig, n. An animal (*Porcus omnivorus*) closely allied to the human race by the splendour and vivacity of its appetite, which, however, is inferior in scope, for it sticks at pig.

Turkey, n. A large bird whose flesh when eaten on certain religious anniversaries has the peculiar property of attesting piety and gratitude. Incidentally, it is pretty good eating.

Ambrose Bierce
The Devil's Dictionary

PERSONAL NEWS

Arthur Cronquist (1919 - 1992)

Taxonomic botany has lost one of its larger-than-life figures with the death on 22 March of Arthur Cronquist.

His wide synthesis of information resulted in the *Integrated System of Classification of the Flowering Plants*, which is the basis for the arrangement of families in the *Flora of Australia*. He produced many revisions — especially in the Asteraceae — as well as flora treatments of substantial parts of North America, and also contributed to botanical nomenclature.

He remained active long after his retirement, and was working in botany to the time of his death. All who met him will remember his wide knowledge, lively mind, and sense of humour.

Barbara Briggs
National Herbarium of New South Wales

The following notes are taken from the obituary published in *The New York Times*.

Dr. Arthur Cronquist, a senior scientist at the New York Botanical Garden, died on Sunday, while doing research at the Brigham Young University Herbarium in Provo, Utah. He was 73 years old. He died of a heart attack.

Dr. Cronquist was born in San Jose Calif. He earned bachelor's and master's degrees from Utah State University, and received his doctorate from the University of Minnesota.

After completing his graduate studies, Dr. Cronquist was an assistant curator at the New York Botanical Garden for two years. He taught at the University of Georgia and the State College of Washington (now Washington State University). He later returned to the New York Botanical Garden, becoming director of botany and finally senior scientist. He was also an adjunct professor at Columbia University and the City University of New York for more than a decade.

He received the Leidy Medal of the Academy of Natural Sciences in Philadelphia, the Asa Gray Award from the American Society of Plant Taxonomists, and the Linnean Medal for Botany from the

Linnean Society of London. Dr. Cronquist also served as president of the Botanical Society of America and of the American Society of Plant Taxonomists.

Dr. Cronquist was widely recognized for his extensive knowledge of the plants of the world. He was also internationally renowned for his ability to synthesize data from the entire plant kingdom in his classification system.

In 1968, Dr. Cronquist published *The Evolution and Classification of Flowering Plants* (Scientific Publications, New York Botanical Garden), one of his books outlining what became known as the Cronquist classification system. In his system, Dr. Cronquist organized some 350 families of plants by their presumed evolutionary relationships, describing which families are very closely related and which are more distantly related. The system has been the most widely used and accepted reference for botanists studying the evolution of plants for nearly 25 years.

In deciphering the relationships of the families of plants, Dr. Cronquist depended more on his intimate knowledge of many species of plants from field, museum and library studies than on the high-powered computer technology or statistics more popular among his younger colleagues.

He also wrote the *Manual of Vascular Plants of the Northeastern United States and Adjacent Canada* (Scientific Publications, New York Botanical Garden). This manual is a key that allows a person to identify flowering plants or ferns from the region, and is the basis for many popular field guides. His two introductory botany textbooks, as well as the manual, are widely used by botany students.

Dr. Cronquist was also a recognized expert on the plants of the western United States. He wrote or contributed to nearly all of the major works on the plants of the region, and was at work on a six-volume series about the plants of the inter-mountain west when he died. He was also an expert on the sunflower family, one of the largest families of flowering plants in the world.

He is survived by his wife Mabel, two children, John of Placentia, California, and Elizabeth Crowe of Morrison, Colorado, and four grandchildren.

REVIEWS

Plant Systematics. Second edition.

By Samuel B. Jones and Arlene E. Luchsinger. McGraw-Hill Book Company, New York. 1986. xiii+512 pp. ISBN 0-07-032796-3. \$55.

Fundamentals of Plant Systematics.

By Albert E. Radford. Harper & Row, New York. 1986. xiii+498 pp. ISBN 0-06-045305-2. \$70.

These reviews continue the series started in the last *Newsletter* (70: 30-33), to assess how well the current crop of plant taxonomy textbooks meet the challenge of presenting systematics as a modern science, rather than as a more traditional scholarly exercise. There is, thankfully, a tendency for these modern texts to attempt to portray systematics as a basic science within biology, being rooted in its historical past and yet also being periodically invigorated by new techniques, methodological debates and types of data. However, this tendency still ends up treating the current invigorations as interesting sidelines, while the ideas that the authors grew up with are treated as the true state of the art.

The book by Samuel Jones (a botanist) and Arlene Luchsinger (a librarian) is aimed at about the same level as the book by Clive Stace reviewed in the last *Newsletter* — university biology undergraduates who have already had an introductory botany subject. However, the authors also hope to attract serious amateurs, teachers, and professionals in other fields, and the level of exposition would certainly not deter such people.

The book is a revised edition of one first published in 1979, which was well received for its wide scope and readable presentation. It is organised into 14 chapters, plus four appendices; however, the order of the chapters is odd, with both chapter 6 and chapter 10 being more logically located elsewhere. The publication quality is good, but there are still quite a number of typographical errors. There are many line illustrations and photographs to break up the text, which occupies only about three-quarters of the pages. The index is comprehensive, including all generic names; and there is an extensive bibliography at the end of each chapter. The examples used are often wide-ranging, but most of the plants discussed were

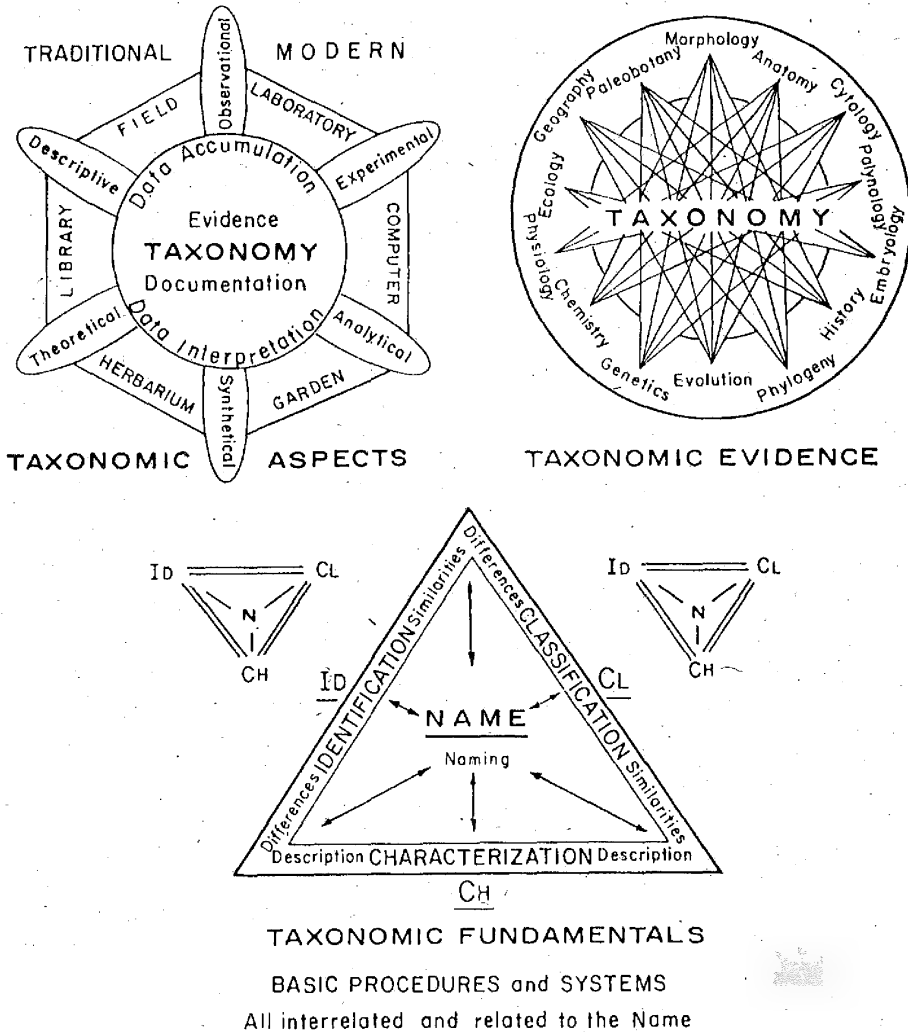
chosen because they are important elements of the flora of North America.

The writing style is unashamedly "American", which can get on your nerves after a while, although it's a change from the rather more stuffy Britishness of many other texts. The Preface is, fortunately, the worst offender, describing taxonomy as "exciting" (twice), "interesting", "important", "fascinating" (twice), "attractive", "useful", "active", and "stimulating", all within the space of 25 lines. The style settles down a bit after this.

The first chapter is an Introduction to Systematic Botany, a brief (10 pages) coverage of what systematics is and what it tries to do. It starts this with commendable straightforwardness, but then it begins to wander around a bit, and only four of the five stated objectives of taxonomy are discussed more fully. Chapter 2, the Historical Background of Classification, is an account (27 pages) of the phases through which taxonomy has passed, which is far more detailed about the past than about the present. Chapter 3 describes Plant Nomenclature (17 pages), but this suffers from some loose terminology, and from using abbreviations and special words without explanation. It is also interesting to note that the authors blandly state that "nomenclatural procedures were standardized on a worldwide basis" in 1930, without also indicating that this could have happened 25 years earlier if the Americans had co-operated.

Chapter 4, covering the Principles of Plant Taxonomy (27 pages), is one of the greater weaknesses of the book, because it is here that systematics should be presented as a science, but is instead presented as an exercise in pragmatism. The explanations are often vague, with species, for example, being treated as intuitive entities and classifications as "by definition subjective". Statements such as: "Subjective classification is often criticized by biologists whose training does not include a knowledge of the principles of systematics or taxonomic methods" completely ignore the substantial criticisms that also come from those who *do* have such knowledge. Furthermore, this chapter offers no presentation of the theoretical rationale for any of the techniques discussed, only a description of the processes involved in carrying them out. Thus, phenetics and cladistics are described as being "computer techniques", in spite of the fact that the computers are merely calculation tools, and these

SYSTEMATICS PROSPECTIVE and SUMMARY



Summary of the multi-faceted nature of systematics. From Radford (1986).

techniques are criticized for things that are general failures of systematics (such as character definition, polarity, reticulate evolution, etc.).

Chapter 5 is a good coverage of Sources of Taxonomic Information (32 pages), but there is a definite bias towards chemotaxonomy. Chapter 6, The Origin and Classification of the Magnoliophyta (43 pages), gets off the track by discussing the postulated origins of flowering plants, but recovers

by effectively summarizing all of the modern classifications (which none of the other books do). Unfortunately, the scheme chosen for the rest of the book is that of Cronquist, apparently simply because he provides detailed descriptions of each of the families. This choice is based on pragmatism, and thus contradicts their earlier statement that: "Truly phylogenetic classifications are the ultimate aim of taxonomy" (which would seem to dictate the

selection of Dahlgren's scheme, of those currently available). This chapter would also make more sense if it was placed between chapters 13 and 14.

Chapter 7 is a good coverage of Evolution, Variation and Biosystematics (31 pages), while chapter 8 is a good exposition of Specimen Preparation and Herbarium Management (19 pages). Chapter 9, Methods of Identifying Plants (9 pages), is somewhat brief given its topic, and the discussion of the use of computers suggests that automated character-set methods will only be useful in difficult situations, rather than any time that information is being made available to non-experts. The Terminology of Flowering Plants (37 pages) is covered in chapter 10, which would be better placed after chapter 7. It uses some uniquely American spellings. Chapter 11 presents a Selected Literature of Systematic Botany (8 pages), which has a useful annotated bibliography.

Chapters 12 to 14 cover Pteridophytes (17 pages), Gymnosperms (15 pages), and Angiosperm Families (158 pages), respectively. Each chapter presents a classification scheme, and then briefly reviews the relevant characters as related to the North American representatives. This is their greatest weakness — the character states discussed are correct in the American context but aren't always so on a world scale, and most of the southern hemisphere families are ignored completely.

Appendix 1 is a useful glossary of Latin and Greek words, Appendix 2 is an extensive bibliography of literature useful for identifying North American plants, Appendix 3 outlines Cronquist's classification, while Appendix 4 outlines Thorne's scheme.

Within its limitations this is a good introduction to plant systematics. However, those limitations can be very severe. Firstly, the book is squarely aimed at the North American market, and it therefore presents a bias in its data that is much greater than in either of the books previously reviewed — this makes nearly half of the book of dubious value to the majority of the human beings on this planet.

Secondly, the authors have taken a very traditional approach to the coverage of the topics — learning the characteristics of the various parts of the plant kingdom is apparently what it's all about. Personally I hated that part of my own training, and I'm eternally grateful that I live in Australia, where the majority of the plants are in only a dozen families. I'm not entirely convinced that, for example, biochemists see much use in memorising the structure of all known organic molecules, so why do botanists insist on memorising so many

plants? Surely there is more to science than this?

Thirdly, systematics is not really successfully presented as a science. Lip service is certainly paid to such a presentation, but it is unconvincing. No sooner is a sound scientific principle clearly enunciated than it is then ignored in the name of pragmatism. The discussions of recent developments read as though they are insertions into the second edition, rather than being integral parts of the original plan for the text, and they are not entirely accurate.

Finally, the authors make a conspicuous attempt to be unbiased in their descriptions of each of the principles and techniques, thus avoiding the obvious personal biases in, for example, Clive Stace's book, where personal judgements often seem to obscure a balanced presentation. However, in the process their descriptions become rather bland, and they concentrate solely on the practical processes involved in each technique rather than on the rationale for the technique in the first place. Science is as much about rationale as process.

So, in spite of the authors' claims to the contrary, once again this book is not really about taxonomy as a modern science. It is far too traditional in its approach for that. To be successful, chapter 14 (and possibly also chapter 6) should be reduced, and chapter 4 then completely re-written. Still, the book is far more wide-ranging in its scope than its competitors, and is therefore probably the best of the bunch so far.

The book by Albert Radford (with contributions by seven others) is aimed at senior undergraduate biology students or postgraduate students in related fields. It is deliberately organised as a university textbook, each chapter containing a formal summary of objectives, a synopsis, a list of questions, and suggested practical exercises. It would not be suitable as an introductory text for anyone other than formally-trained students.

The book is a heavily-modified version of *Vascular Plant Systematics*, a multi-author reference text and source book published in 1974, and many sections are acknowledged to be straight re-writes of sections of that book. It is organised into 13 chapters in two parts (Taxonomic Concepts, Processes and Principles; and Systematic Institutions), plus five appendices in the third part (Taxonomic Resource Information). The publication quality is generally good, although typographical errors are not all that hard to find, and part of Table 6.3 is a real mess. There are not many line drawings or other means of breaking up the text; and the index does not include many taxonomic names.

There is a short list of suggested reading at the end of each chapter, while examples are used somewhat sporadically, and are typically North American.

Let me start by saying that the biggest drawback of this book is its organisation and style. The arrangement of each chapter is very formal, with clearly-stated learning objectives for the students, covering definitions, purposes, operations, premises, principles, and guidelines. These can be very useful, but they reduce the whole presentation to a rigid learning exercise, rather than being an enthusiastic exposition (which all of the other reviewed books are). Each chapter ends with a list of theoretical questions and practical exercises, which are also useful but far too reminiscent of unwanted chores.

The worst part, however, is the writing style (with a couple of notable exceptions), which is pedantic to the point of exasperation. Each statement is made with such close attention to unambiguous presentation and formal terminology that each sentence is almost unreadable. To add insult to injury, the writing style also favours using nouns as adjectives, has seemingly endless compound words (e.g. "are presented in this section from a definition / reasons for use / how used / characters used / reference standpoint"), and is full of unnecessary jargon (e.g. "evidentiary information" instead of "evidence"). Making it all the way through this book was a major challenge, and one that I could well have done without.

These presentation faults are unfortunate, because as far as the actual content is concerned the book is mostly very good. The ideas are generally covered logically and thoroughly, and the presentation is well-balanced more often than not. There is the odd place where Radford is dogmatic about things that I don't agree with, but that is a relatively minor blemish. The style, however, means that I wouldn't wish this book on my worst enemy.

The Prologue (10 pages) sets the scene by taking a long time to say almost nothing comprehensible. Anyone who wants a lesson in obfuscation could do a lot worse than read this part. It *appears* to be about the philosophy of the book itself. Chapter 1, A Foundation for the Study of Plant Systematics (24 pages), follows the same line, and gets so tied up in the formality of the presentation that the actual meaning is almost lost. It is here that taxonomy most notably fails to be presented as a science, just where the reader should be enticed into the subject.

Chapter 2, History of Plant Taxonomy (23

pages), was written by T.M. Barkley, and is written much more comprehensibly. However, it concentrates heavily on North America, has no illustrations, and suffers the usual problem of treating contemporary ideas as a trivial afterthought. Chapter 3, Plant Nomenclature (15 pages), is commendably precise about a subject where precision is paramount, but the discussion of types has no examples and lacks clarity, and the names of varieties are treated as quadrinomials rather than as trinomials. Chapter 4, Botanical Names (29 pages), was written by Laurie S. Radford, and is an interesting but somewhat irrelevant coverage of the formation, meaning and pronunciation of latin names.

The next six chapters form the heart of the book. Chapter 5, Plant Description (39 pages), has lots of practical detail about types of plant characters and their variation, and is therefore rather boring to read. Chapter 6, Plant Classification (13 pages), manages to discuss its topic without describing any of the current classification schemes. Furthermore, it equates modern classifications with phenetics (citing Charles Jeffrey as the source of the natural = phenetic argument), indicating that these are "generally accepted as fundamental assumptions for modern taxonomic and classificatory research". The phylogeny is then stated to be derived from this phenetic classification.

Chapter 6, Plant Identification (11 pages), is a somewhat cursory coverage, and the uses of computers (in particular) are glossed over. Chapter 7, Taxonomic Evidence (24 pages), is rather interestingly arranged, with very little discussion, being mostly just lists of examples. There is no mention of modern genetic sequencing techniques, and there is a tendency to prefer quantity of characters over quality. Chapter 8, Variation and Speciation in Plants (19 pages), is a very sensible coverage, although the variation part is a bit skimpy on genetics, and the speciation part is just a summary of Verne Grant's book.

Chapter 10, Phylogeny and Structural Evolution of Plants (32 pages), was written by Michael G. Simpson, and stands out like a beacon among the surrounding pedantry. Not only is it written in normal English, it is far and away the best presentation of cladistics in any of the books that I've reviewed so far. This is not to say that there aren't occasional lapses (such as treating branching as being superimposed on the presentation of the cladogram rather than being the fundamental basis of the production of the cladogram in the first place), as well as odd terminology (such as calling a "transformation series" a "morphocline"), but what

the hell. Needless to say, the principles expounded in this chapter are at complete odds with those presented by Radford earlier in the book.

The remaining three chapters, The Botanic Library and Taxonomic Literature (17 pages), The Herbarium (11 pages), and Botanic Gardens and Arboreta (13 pages), are all effective summaries of their respective topics, and even Australia gets a mention in chapter 13.

The appendices are intended as reference sources. Appendix A (15 pages) covers Data Analysis in Systematics, by James Doyle. This has a good coverage of the collection of data for numerical analysis; but the analyses are only phenetic, and only selected techniques are discussed (z transformation, euclidean distance, correlation, PCA, UPGMA). Appendix B (15 pages) covers Phenetic and Phylogenetic Classification, by Michael G. Simpson, which has worked examples of how these classifications are actually produced.

Appendix C (78 pages) has descriptions of some of the Families of Flowering Plants. This is based on Cronquist's classification, and (as for the Jones & Luchsinger book) only covers families common in the U.S.A. The families are arranged in alphabetical order, and the choice of which families to include is rather idiosyncratic. Appendix D (47 pages) covers the terminology used in The Structure of Vascular Plants. This is arranged by topic, rather than simply alphabetically, which makes it more useful than other such presentations, and it also covers gymnosperms and "lower" vascular plants. Appendix E (8 pages) covers Collection and Field Preparation of Plant Specimens. The only quibble that I have with this appendix is that it insists that insect-damaged plants should not be collected — this can limit the usefulness of the specimens to, for example, ecologists studying these very insects.

The book ends with an Epilogue (15 pages), partly contributed by Gloria Caddell, Deborah Qualls, and Duane Isely. This has a very good general summary of the practical processes involved in being a systematist, as well as a neat historical summary of more recent intellectual developments (which makes up for the lack of this in chapter 2).

This book is ultimately a rather unfortunate failure. Radford has clearly thought very carefully about the book and about how it should be presented, and the aims of the book are to be commended. From some points of view it is the most impressive of the books covered so far: it tries to follow the theoretical ideals developed for good educators, it tries to be very precise about the intel-

lectual foundations of systematics, it tries to present taxonomy as a scholarly pursuit, it tries to be thorough about techniques, it tries to organize information logically, and it tries to be a good reference source. Unfortunately, it tries too hard, and it falls flat on its face because it's mostly unreadable.

Furthermore, in spite of this over-stated concern with effective learning, there is almost no explicit mention in the book of systematics as a science. The book concerns itself almost exclusively with a description of the details and the foundations of the processes involved in doing taxonomy, but it doesn't present them as part of an exciting scientific enterprise. Taxonomy is presented solely as a *scholarly* exercise, which may or may not also be part of science. The reader could easily come away with the impression that systematics is really part of the arts.

Finally, the book is not coherent enough. It has many good features, but there are unexplained lapses that seem to be inexcusable. The contradictions between Radford's exposition of classificatory techniques and that of Simpson is just one example of unexpected inconsistency, as is the lack of coverage of modern classifications, sequencing techniques and computers. These need to be addressed for the book to be effective.

However, the only way to meet the stated aims of this book would be to completely re-write it. This is an enormous pity, given the obvious effort that has gone into producing it.

David Morrison
Department of Applied Biology
University of Technology, Sydney

Rainforest Fungi of Tasmania and South-east Australia.

By Bruce Fuhrer and Richard Robinson. CSIRO, Melbourne, and the Forestry Commission, Tasmania. 1992. 95 pp. 114 colour illustrations. ISBN 0-643-05311-5. \$19.95.

After a brief introduction dealing with ecology, structure and classification, the bulk of this booklet consists of coloured illustrations of 113 species of rainforest fungi, each accompanied by a short caption.

The rainforest habitat covered is the Cool Temperate Rainforest of Tasmania and Victoria. Whilst many of the fungi illustrated are restricted to this habitat (notably the gondwanan *Cyttaria*,

Cuphocybe, and *Rozites*), a fair proportion are equally to be found in moister eucalypt forests in south-east and, to a lesser extent, south-west Australia (examples are *Boletellus obscurecoccineus*, and *Marasmiellus affixus*), or are even cosmopolitan (as is the case for *Melanophyllum echinatum*). The diversity of habitat specificities shown by the included species is unfortunately not often referred to in the captions, but it does reflect the interesting composition of the rainforest mycoflora, and it means that the work will be useful beyond the specific habitat indicated in the title.

The beauty of form and colour that are a feature of the fungi are amply displayed: highlights are the brilliant greens, yellows, reds and oranges of the various members of the Hygrophoraceae, and the depiction of the gill architecture of *Anthrachophyllum archeri* and the cascading spines of *Hericium clathroides*. The colour rendition in the illustrations is generally excellent, as is their quality in both choice of subject and composition.

Lighting conditions for photography in rainforests are poor at the best of times, but Fuhrer has generally managed to avoid the ugly flash flares that often appear in fungal photos taken under such conditions. The backgrounds are also well lit, and the detail shown provides both an aesthetic backdrop, exemplified by the bryophyte carpets from which arise *Hypholoma brunnea* and *Mycena epipterygia*, and also places the fungi in their habitat rather than presenting them as isolated objects.

The illustrations are of different sizes and are placed in varying positions on the page, which is a departure from the normal more rigid layout of most other field guides, but which is generally successful, and this sets the tone for a work aiming at introduction rather than at being a comprehensive guide. In a few cases only are the illustrations too small or somewhat hidden in the binding fold.

Species are arranged under ten major groups, based on the texture of the fruiting body and on the nature of the fertile surface. Most species belong to the agarics. Not all "hypogean fungi" are related, and hence it would be more appropriate to group the species placed under this heading as "gasteroid agarics" (or puffball-like mushrooms). Within each major group, arrangement is mostly alphabetical by genus, except that the genera of two families of agarics (Cortinariaceae and Hygrophoraceae) are grouped together under an introductory caption; although *Gymnopilus*, *Phaeocollybia*, and *Rozites* are inexplicably listed separately rather than with the Cortinariaceae, where they belong.

Where more than one species of a genus is illustrated, an introductory caption for the genus is often provided. Consequently, the arrangement of the text is in places a little confusing, because captions for sets of species headed by a genus caption often run directly on to captions for species that should stand alone.

As well as an intention to "introduce the rich fungal flora", the authors also aim to "provide a guide book to aid the layperson with naming fungi which they will encounter on a rainforest walk". Despite some detail on microscopic structure in the introduction, there is no further information on the microscopic characters of individual species — information that is vital in classification, yet which is inevitably omitted given that the book is for the layperson.

There is a simple visual key to the ten major groups, but beyond this no further aids to identification are provided. Some might see this as a defect, but it is one that is difficult to overcome, for two reasons. Firstly, there are many more rainforest macrofungi than are illustrated (at least ten times as many, I would think), and hence any key would be merely one to those species included. Secondly, a key using only macroscopic characters would seem to be quite difficult to construct — many of the differences being subtle and yet reasonably well-perceived by direct comparison with the illustrations. In fact, the quality of the illustrations means that identification should be relatively simple, by means of flicking through and visually comparing an unknown — as long as the species concerned is illustrated.

More than one third of the included species are identified only to genus, or, less often, are denoted as having an affinity to known species. It is no doubt disconcerting to find that so many species are un-named, but this is an accurate reflection of the current state of knowledge of the Australian mycoflora. Several of the illustrations that are un-named represent, in all likelihood, the only known collection. A valuable feature of the book is that many of the species are illustrated in colour for the first time, and several of the illustrations depict genera or species not previously recorded from Australia.

A few small errors include "*Lentinellis*" for *Lentinellus* (p. 47), "*Gaestrum*" for *Gaeastrum* (pp. 67, 93), "*Herecium*" for *Hericium* (p. 94), and "*Hmidicutis*" for *Humidicutus* (p. 94). The *Nova Hedwigia* references (p. 92) should be to the *Beihfte* of that journal.

Some people might not agree with the use of segregate genera such as *Gliophorus* whilst at the same time including *Dermocybe* within *Cortinarius*.

Psilocybe echinata belongs in *Psathyrella*, but the combination has not yet been formally made, which is hardly the authors fault. The nomenclature is very up to date, and the names given to the illustrations are appropriate, at least as far as would be possible with available literature.

It is pleasing to see the statement that voucher specimens for the illustration have been lodged at a recognised herbarium (HO). It might seem a little too much to ask that photographers or illustrators keep vouchers; but, in my opinion, the lack of vouchers detracts significantly from the long-term usefulness of several recent publications dealing with Australian fungi, because many species must by necessity be un-named or placed under names of broad application, and it is only by access to specimens that most can be in future identified.

It is gratifying to note the involvement of the Tasmanian Forestry Commission in the publication of this book — it is to be hoped that their desire to assist in making known the beauty and diversity of the rainforest mycoflora is mirrored by an equal concern on their part for the preservation of the rainforest habitat.

This book lives up well to its aims, and it should do much to stimulate interest in the taxonomy, biology and conservation of this often overlooked kingdom.

Tom May
National Herbarium of Victoria.

A Distant Island.

By Nancy Cato. New English Library, Hodder & Stoughton, 1988. 262 pp. ISBN 0-450-41925-3. \$8.95

This volume will not be found in the botany bookshelves, but among the paperback novels ... but don't let that fool you, for it is a fascinating story about Ronald Campbell Gunn (1808-1881), the most eminent botanist and collector of natural history specimens in Tasmania.

Nancy Cato has used information from many libraries, and from Gunn's descendants. She quotes many letters from Gunn, particularly to William Hooker at Kew, and also some of Hooker's letters, as well as letters written by people with whom Gunn associated, including Lady Franklin, wife of the Governor.

It is a personal story, telling of the life of the man and his family, but including his passion for learning about the native plants of Tasmania. It

tells of his many collecting trips while he was working at other positions, such as Superintendent to the Lieutenant-Governor, Sir John Franklin. In the telling, we also meet John Gould, of bird fame, and also the young Joseph Hooker when he arrived in Hobart. The text is nicely sprinkled with plant names, both common and scientific.

Any botanist will find empathy with Ronald Gunn, with the successes, the sadnesses, the happiness and fulfillment in this absorbing story, as told by Nancy Cato.

George Chippendale
Canberra

Recent Publications

Bignoniaceae – Part II (Tribe Tecomeae).

By Alwyn H. Gentry. New York Botanical Garden, New York. 1992. 370 pp. ISBN 0-89327-368-6. \$100.

The Limnocharitaceae

By Robert R. Haynes and Lauritz B. Holm-Nielsen. New York Botanical Garden, New York. 1992. 34 pp. ISBN 0-893277-369-4. \$23.

The Conservation Atlas of Tropical Forests. Asia and the Pacific.

Edited by N.M. Collins, J.A. Sayer, and T.C. Whitmore. 1991. ISBN 0-333-53992-3. \$115.

Biological Approaches and Evolutionary Trends in Plants.

Edited by Shoichi Kawano. Academic Press, London. 1990. ISBN 0-12-402960-4. \$85.

The Conifer Manual. Volume 1.

By Humphrey J. Welch. Kluwer Academic Publishers, Dordrecht. 1991. ISBN 0-7923-0616-3. \$235.

Evolution in the Outback

By Jan Taylor. Kangaroo Press, Kenthurst. 1987. ISBN 0-86417-105-6. \$24.95.

The Compleat Cladist

By E.O. Wiley, D. Siegel-Causey, D.R. Brooks and V.A. Funk. The University of Kansas Museum of Natural History Special Publication No. 19. 1991. x+158 pp. ISBN 0-89338-035-0.

NOTICES

Requests for material

Erysiphales (powdery mildew fungi) of Australia

The Erysiphales are microscopic Ascomycetes that are obligate, biotrophic parasites of angiosperms, mostly dicotyledons, on which they cause disease symptoms known as powdery mildews. I have been fortunate enough to win the ABRIS grant to revise the Erysiphales of Australia.

Powdery mildew fungi are difficult organisms to work with taxonomically. Firstly, they are pleomorphic, and the taxonomy of the group is based primarily on the teleomorph. Because of our climate, this is very rarely seen on Australian Erysiphales collections. Unfortunately, existing taxonomic systems are very heavily biased towards the teleomorph. Anamorphs are difficult to identify with teleomorphs, partly because very little detailed research has been done on their morphology.

Furthermore, they do not keep well as dried herbarium specimens or as permanently preserved microscope slides, and they cannot be grown in artificial culture. In addition, spore germination patterns are important taxonomic criteria, and spores can only be germinated if they are alive. This means that all observations, drawings and measurements have to be carried out on freshly collected specimens.

The only solution is to build up a network of collectors who will forward specimens in such a way that they arrive in the freshest condition possible. The best way is not to package the specimen so that it stays moist (because it will go mouldy in transit), but to package it in such a way that it dries slowly in transit but should still be alive and in good condition when it arrives.

The project starts in July, and we are now seeking collectors who will be prepared to send all specimens of powdery mildews that they see. Collectors will be provided with stamped, addressed packaging material, so that all they have to do is put the specimen in the packet and post it. The packaging will consist of a large envelope, containing some paper to swelling and cardboard to keep the specimen flat; in effect a small plant press.

If you are interested in being part of our collecting team, please let me know as soon as possible.

Those people who are not sure what a

powdery mildew is, will undoubtedly have seen white fungal growths on leaves of cucurbits, roses, oaks, and crepe myrtles. The majority of Australian mildew records are on introduced ornamentals, crops or weeds, but a number of mildews have been recorded on native plants in natural habitats, and we would very much like to add to our knowledge of these Australian mildew fungi.

We are also very keen to add to our knowledge of teleomorphic mildews. These can be detected in the field by observation (under a hand lens) of small black spherical structures scattered through the mildew colonies. If you see anything that fits this description, please send lots of material.

People who have not formally expressed interest in collecting for us are still welcome to send the occasional specimen that they may come across. We aim to obtain, over the three years of the project, as complete a picture as possible of the powdery mildew fungi of Australia.

Please contact:-

Ian Pascoe,
Institute of Plant Sciences
Burnley Gardens
Swan St. Burnley. Vic. 3121
Tel. (03) 8101511

Ian Pascoe
Victorian Department of Agriculture

Clematis fruits

As part of ongoing studies in the genus *Clematis* in Australia, the morphology of seedlings is being examined, and chromosome numbers are being counted.

We are seeking to obtain material from all species from throughout their respective ranges. We would be most grateful to receive fresh (i.e. not heat dried), ripe (i.e. just when falling off) fruits of any species, accompanied by a pressed, dried, labelled voucher specimen for each fruit.

Please send material to:-

Mr B.J. Lepschi and/or Dr H.J. Eichler
Australian National Herbarium
GPO Box 1600
Canberra. A.C.T. 2601.

Brendan Lepschi and Hansjörg Eichler
Australian National Herbarium

A.S.B.S. CHAPTER CONVENERS

Adelaide

Bill and Robyn Barker
State Herbarium of South Australia
Botanic Gardens
North Terrace
ADELAIDE, S.A. 5000.
Tel: (08) 228-2303

Hobart

Tony Orchard
Tasmanian Herbarium
University of Tasmania
G.P.O. Box 252C
HOBART, TAS. 7001.
Tel: (002) 20-2635

Brisbane

Laurie Jessup
Queensland Herbarium
Meiers Road
INDOOROOPIILLY, QLD. 4068.
Tel: (07) 371-3511

Melbourne

Tim Entwisle
National Herbarium of Victoria
Birdwood Avenue
SOUTH YARRA, VIC. 3141.
Tel: (03) 655-2313

Canberra

Jeremy Bruhl
Research School of Biological Sciences
Australian National University
G.P.O. Box 475
CANBERRA, A.C.T. 2601.
Tel: (06) 246-5175

Perth

Jenny Chappill
Department of Botany
University of Western Australia
NEDLANDS, W.A. 6009.
Tel: (09) 380-2212

Darwin

Clyde Dunlop
Darwin Herbarium
Conservation Commission of the N.T.
P.O. Box 496
PALMERSTON, N.T. 0831.
Tel: (089) 89-5511

Sydney

Murray Henwood
Botany Building (A12)
University of Sydney
SYDNEY, N.S.W. 2006.
Tel: (02) 692 3262

Telephone and Fax Numbers for Major Australian Herbaria

International dialling sequence from outside Australia:-
add the Australian country code 61 and omit the leading zero of the area code.

AD	BRI	HO	MBA
Ph: (08) 2282311	Ph: (07) 8779328	Ph: (002) 202635	Ph: (070) 921555
Fax: (08) 2231809	Fax: (07) 3716655	Fax: (002) 207865	Fax: (070) 923593
CANB	CBG	MEL	NSW
Ph: (06) 2465113	Ph: (06) 2509450	Ph: (03) 6552300	Ph: (02) 2318111
Fax: (06) 2465249	Fax: (06) 2509599	Fax: (03) 6552350	Fax: (02) 2514403
DNA	FRI	PERTH	QRS
Ph: (089) 894516	Ph: (06) 2818211	Ph: (09) 3670500	Ph: (070) 911755
Fax: (089) 323849	Fax: (06) 2818312	Fax: (09) 3670515	Fax: (070) 913245

This list will be kept up to date, and will be published in each issue.
Please inform David Bedford (NSW) of any changes or additions.

The Society

The Australian Systematic Botany Society is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the Society is to promote the study of plant systematics.

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the *Newsletter*. Any person may become a member by forwarding the annual subscription to the treasurer. Subscriptions become due on January 1 each year.

The Newsletter

The *Newsletter* appears quarterly, keeps members informed of Society events and news, and provides a vehicle for debate and discussion. In addition, original articles, notes and letters (not exceeding ten published pages in length) will be considered.

Contributions should be sent to one of the editors at the address given below. They should preferably be submitted as an unformatted word-processor or ASCII file on an MS-DOS or Macintosh diskette accompanied by a printed copy, or as two typed copies with double-spacing.

The deadline for contributions is the last day of February, May, August, and November.

All items incorporated in the *Newsletter* will be duly acknowledged. Authors alone are responsible for the views expressed, and statements made by the authors do not necessarily represent the views of the Australian Systematic Botany Society Inc. *Newsletter* items should not be reproduced without the permission of the author of the material.

Notes

ASBS annual membership is \$25 (Aust); full-time students \$12. Please make cheques out to ASBS Inc., and remit to the treasurer. All changes of address should be sent directly to the treasurer, as well.

Advertising space is available for products or services of interest to ASBS members. Current rate is \$100 per full page, \$50 per half-page or less. Contact one of the *Newsletter* editors for further information.

Editors

Ms B.M. Wiecek

National Herbarium of NSW
Royal Botanic Gardens
Mrs Macquaries Road
SYDNEY NSW 2000
Tel (02) 231 8130
Fax (02) 251 4403

Dr D.A. Morrison

Department of Applied Biology
University of Technology, Sydney
PO Box 123
BROADWAY NSW 2007
Tel (02) 330 4159
Fax (02) 330 4003

Cover

David Mackay

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CONTENTS

Editorial

.....	1
-------	---

Articles

A new method for increasing the robustness of cladistic analyses	
by D. Morrison.....	2
The correct author citations for <i>Calotropis gigantea</i> and <i>C. procera</i> (Asclepiadaceae)	
by P.I. Forster.....	5
Guidelines for the preparation of requests to the Australian Botanical Liaison Officer at Kew	
by G.P. Guymer.....	6

Commentary

Systematic scientism	
by A. Hay.....	7
Systematic science	
by D. Morrison.....	8

Australian Systematic Botany Society Business

Minutes of the Fourteenth General Meeting.....	10
Treasurer's report.....	12
Minutes of the Council meeting, March 1992.....	19
A.S.B.S. Constitution and the new A.C.T. Incorporation Act.....	21
Symposium in far north Queensland.....	22
A.S.B.S. Member profiles.....	22

Reports

Australian Botanical Liaison Officer, Kew.....	26
Australian Biological Resources Study.....	26
A.S.B.S. Melbourne chapter.....	27
A.S.B.S. Adelaide chapter.....	28
Council of Heads of Australian Herbaria, 19th annual meeting.....	28
International Organization for Plant Information.....	30

Personal News

Arthur Cronquist.....	31
-----------------------	----

Reviews

Plant Systematics, Fundamentals of Plant Systematics.....	32
Rainforest Fungi of Tasmania and South-east Australia.....	36
Recent Publications.....	38

Notices

.....	39
-------	----

A.S.B.S. Chapter Conveners, and Herbaria Phone Numbers

.....	40
-------	----

